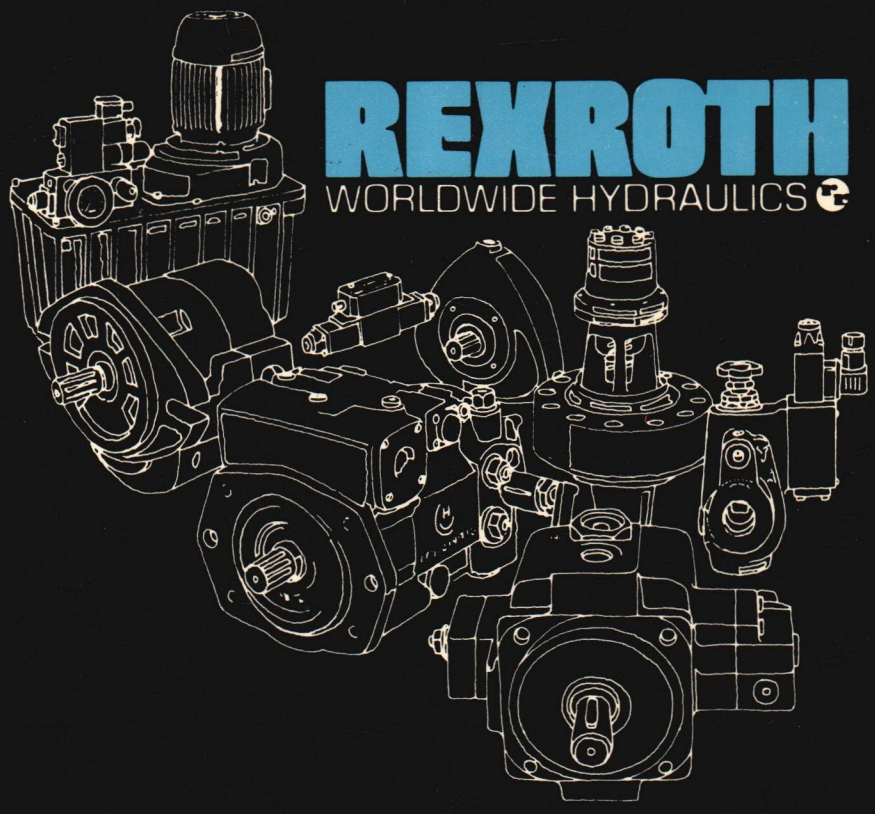
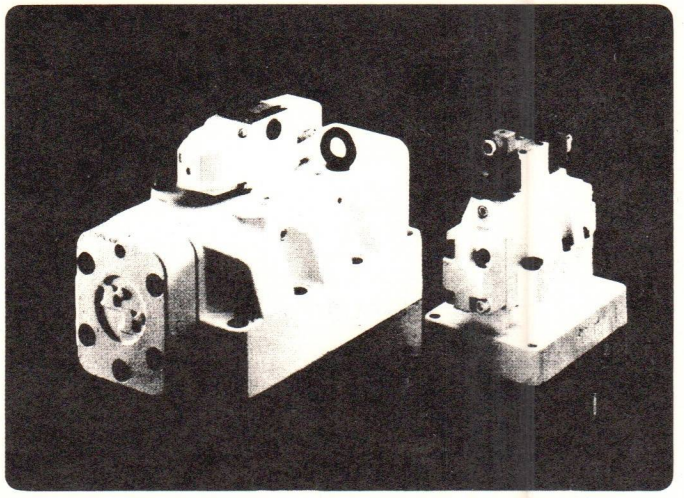


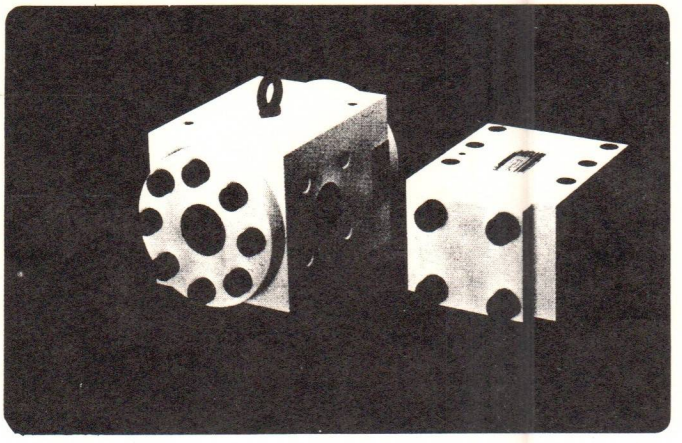
REXROTH

WORLDWIDE HYDRAULICS

Condensed Catalog

Preface



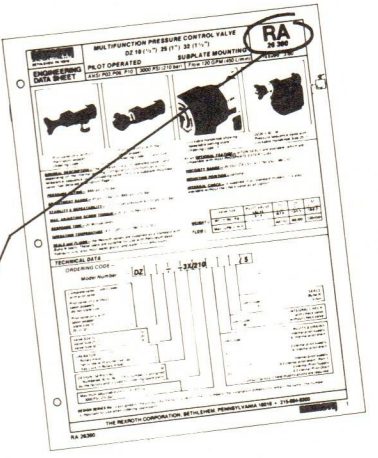


Dear Friend of Rexroth . . .

We are very pleased to have this opportunity to serve our many friends in the Fluid Power Industry, by making available for the first time, a condensed summary catalog of Rexroth's hydraulic components and systems.

The catalog has been produced for your convenience, and is not designed as a replacement for the Rexroth Engineering Catalog, but rather as an easy reference to product availability, size ranges and ordering information, performance and basic dimensional data.

For your added convenience each product category displays the appropriate RA (Rexroth America) Engineering Data Sheet number as a handy reference to complete technical data.



For complete technical assistance, we suggest that you refer to our Engineering Catalog (by RA Number), contact your local Rexroth Distributor or consult with one of our qualified factory representatives.

Using This Catalog

In anticipation of changes and/or additions to this catalog in future reprints, the page numbering system has been designed for optimum flexibility.

Each product group, such as Pumps, Valves, Power Units, etc., has a designated number (i.e. Pumps 1-1, 1-2, 1-3 and so on); and each section features a handy summary guide in front, respectively.

The guide serves as an easy reference to size, displacements and design characteristics.

Sections One through Seven are detailed on the following index.

REXROTH
Industrial Hydraulics Division

Product Index

IMPORTANT NOTICE

The technical components presented in this summary catalog are subject to constant design and manufacturing revision. Contact your local Rexroth Distributor, or the Rexroth Industrial Hydraulics Division (215) 694-8300 for verification of all critical specifications.

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Summary | PUMPS & MOTORS

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	V2	Fixed Dual Vane (Double cartridge type)	9 GPM to 94 GPM up to 2500 PSI	1-1 to 1-3
	V3	Variable-Single Vane Direct Compensated	4 GPM to 22 GPM up to 1500 PSI	1-4 to 1-7
	V4	Variable-Dual Vane Pressure Compensated	8 GPM to 59 GPM up to 2400 PSI	1-8 to 1-12
	R4	Fixed Radial Piston	0.7 GPM to 9.0 GPM up to 10,150 PSI	1-13 & 1-14
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MOTOR, Industrial or Mobile	A6V	Variable Axial Piston	1.71 in^3/rev to 30.4 in^3/rev up to 5800 PSI	1-19 & 1-20
PUMP, Industrial or Mobile	A7V	Variable Axial Piston	9.5 GPM to 302 GPM up to 5800 PSI	1-21 & 1-22
PUMP, Industrial	A2V	Variable Axial Piston	5.5 GPM to 422 GPM up to 5800 PSI	1-23 to 1-25
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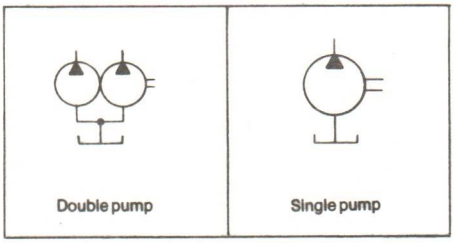
V2 Fixed Vane Pump

The hydraulic pump type V2 is a fixed displacement dual vane type.
The cam ring is double eccentric, therefore two suction and two pressure chambers lie opposite each other, with the result that there is no additional loading on the shaft, which thus only has to transmit the required torque.
Two vanes move freely in each rotor section. This means good sealing between the individual chambers in any rotor position.
The chamfering of the vanes provides a hydraulic balance, the resulting reduced pressure on the inside curve of the cam ring means less friction of the vanes on the cam and therefore a long working life of the pump is obtained.



Symbols

Size 10 to 100

Refer to RA 10336 and RA 10337

Ordering Code (Foot flange and mounting screws to be ordered separately)

2 PF2V2— XX/ 10—10 R L R 1 M

NUMBER OF CARTRIDGES
1 = Single
2 = Double

DESIGN SERIES

PUMP SIZE

	in³/rev	(cm³/rev)
10	= 0.6	(10)
16.6	= 1.0	(16.6)
26.3	= 1.6	(26.3)
36	= 2.2	(36)
50	= 3.0	(50)
63	= 3.8	(63)
80	= 4.9	(80)
90	= 5.49	(90)
100	= 6.1	(100)

ROTATION
R = Clockwise
L = Counterclockwise

PORT LOCATION

Press	Inlet
D = Down	= D
L = Left	= L
R = Right	= R
U = Up	= U

PORT CONNECTION
1 = BSP threads
7 = SAE connection

SEALS
M = Buna-N
V = Viton

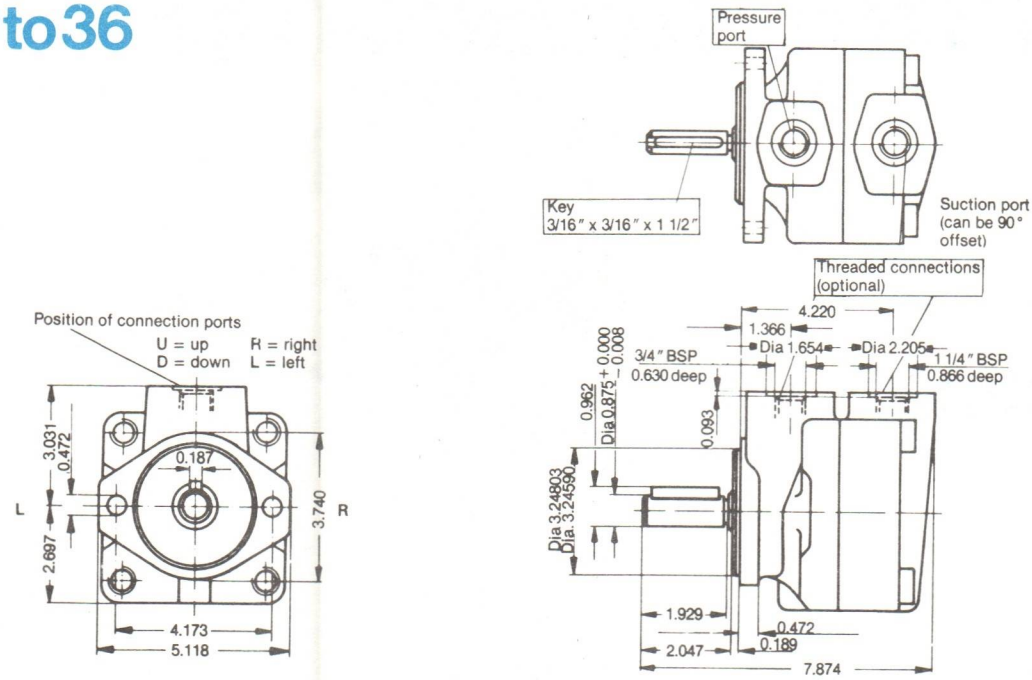
Technical Data

Displacement (in³/rev)	0.6 to 6.10 per cartridge
Hydraulic medium	Phosphate ester — Mineral oil
Viscosity range	73 to 736 SSU
Fluid temperature range	+ 14 to + 160 °F
Filtration	40 µm
Dir. of rotation	clockwise or counter-clockwise
Dir. of flow	Inlet and outlet are independent of dir. of rotation
Shaft loading	Radial and axial forces cannot be transmitted

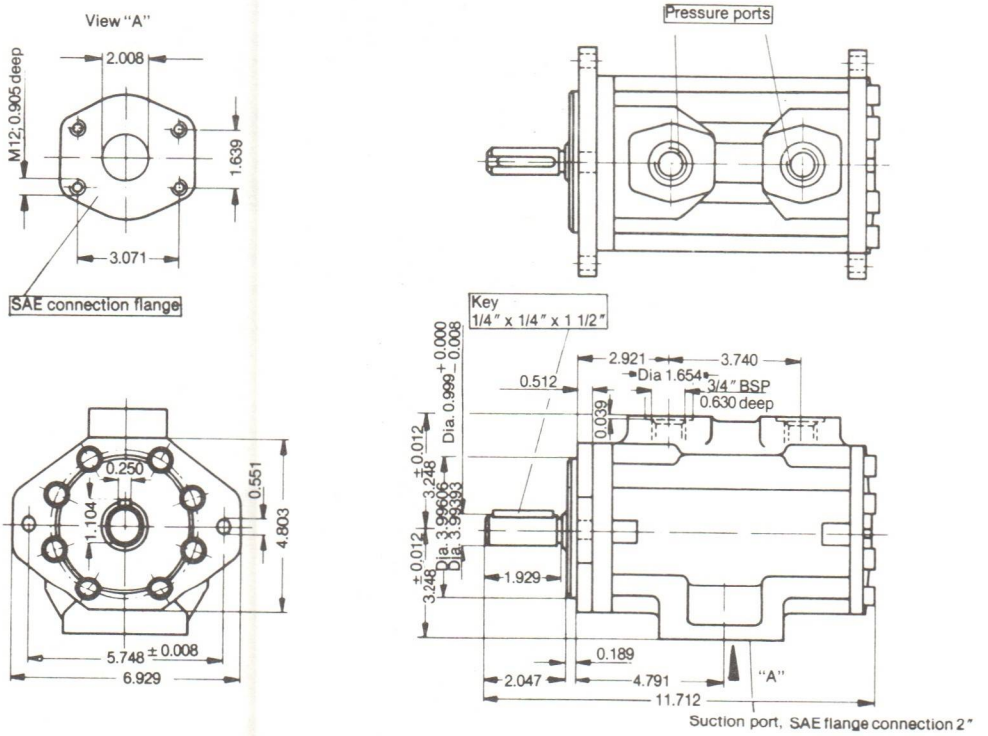
Operating press. range	Speed range	inlet	outlet
Size			
10	900 ... 3000 RPM	3 PSI (negative) to 22.0 PSI (positive)	0....2500 PSI
16.6	900 ... 2400 RPM		0....2500 PSI
26.3 and 36	900 ... 1400 RPM		0.... 900 PSI
26.3 and 36	1400 ... 2400 RPM		0....2500 PSI
50 to 80	1000 ... 1800 RPM		0....2500 PSI
90 to 100	1000 ... 1800 RPM		0.....900 PSI
Weight	single pump: 24.2 lbs.		double pump: 48.4 lbs.
Drive	via flexible coupling		
For application to other specifications please consult us.			

Unit Dimensions: single pump (dimensions in inches)

Size 10 to 36



Unit Dimensions: double pump (dimensions in inches)



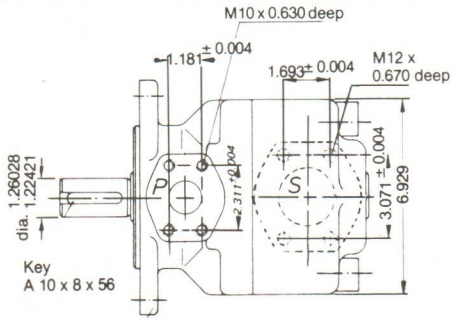
performance data

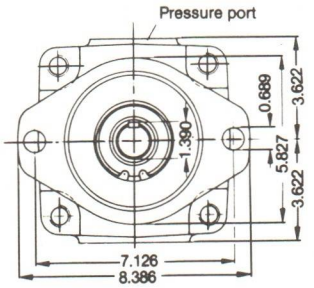
Values refer to 1 pump cartridge

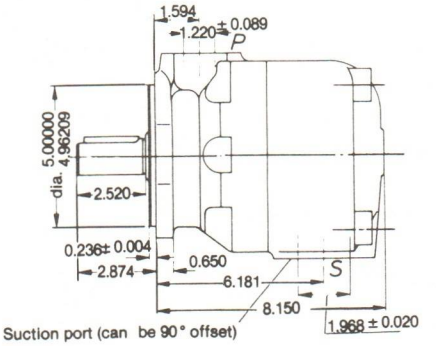
Displacement Volume V (in³/rev.)	Size	Effective flow Q_{eff} and required drive power P_a at n = 1800 RPM, ϑ = 168 SSU, t = 122° F										
Pressure	(PSI)		300	600	900	1200	1500	1800	2100	2400	2500
0.6	10	Q_{eff}	(GPM)	4.51	4.29	3.97	3.78	3.59	3.44	3.30	3.13	3.02
		P_a	(HP)	1.24	2.11	2.98	3.83	4.83	5.46	6.44	7.37	7.93
1.0	16	Q_{eff}	(GPM)	7.60	7.30	7.05	6.81	6.62	6.46	6.30	6.14	5.95
		P_a	(HP)	1.74	3.22	4.59	5.95	7.43	8.67	10.15	11.51	12.63
1.6	26	Q_{eff}	(GPM)	12.29	11.98	11.83	11.70	11.62	11.41	11.21	11.02	10.83
		P_a	(HP)	2.48	4.72	6.82	8.92	11.14	13.37	15.61	17.83	19.47
2.2	36	Q_{eff}	(GPM)	16.86	16.44	16.29	16.03	15.87	15.76	15.65	15.49	15.43
		P_a	(HP)	3.48	6.44	9.17	12.15	15.00	17.86	20.68	23.58	25.75

Unit Dimensions: single pump (dimensions in inches)

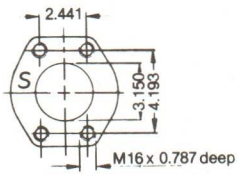
Size 50 to 100



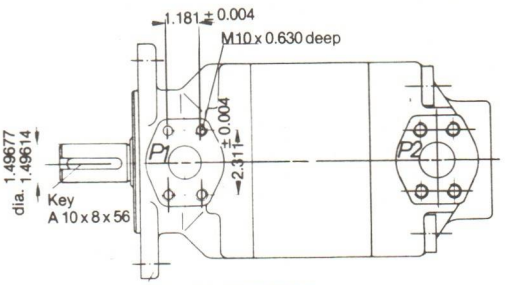




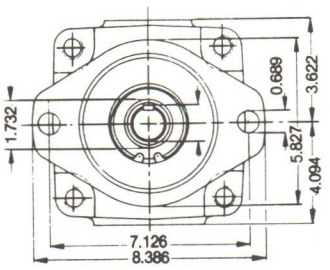
Unit Dimensions: double pump (dimensions in inches)

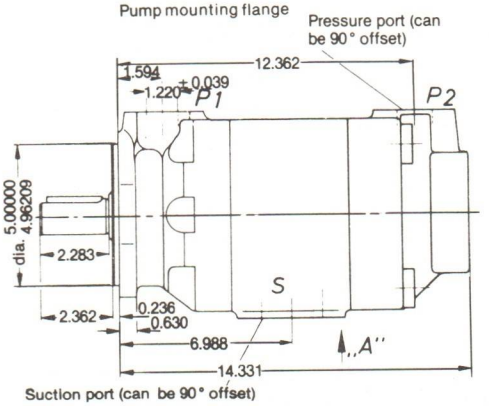


View "A"



Pump mounting flange





Performance Data

Values refer to 1 pump cartridge

Displacement Volume V (in³/rev.)	Effective flow Q_{eff} and required drive power P_a at n = 1800 RPM, ϑ = 165 SSU, t = 122° F									
	Pressure	(PSI)	300	600	900	1200	1500	1800	2100	2400	2500
3.05 (Size 50)	Q_{eff}	(GPM)	23.08	22.83	22.41	22.03	21.65	21.27	21.05	20.70	20.38
	P_a	(HP)	5.47	9.82	13.85	17.87	22.06	26.40	30.59	34.94	38.16
3.85 (Size 63)	Q_{eff}	(GPM)	29.52	28.86	28.44	28.22	28.00	27.62	27.40	27.21	26.63
	P_a	(HP)	6.44	11.59	16.74	22.06	27.37	32.68	37.67	43.15	47.01
4.88 (Size 80)	Q_{eff}	(GPM)	37.37	36.63	36.29	35.62	35.27	34.95	34.86	34.63	34.32
	P_a	(HP)	7.89	14.97	21.41	27.85	34.78	41.54	47.98	54.90	59.25
5.49 (Size 90)	Q_{eff}	(GPM)	41.90	41.65	41.27	—	—	—	—	—	—
	P_a	(HP)	9.82	17.23	23.67	—	—	—	—	—	—
6.10 (Size 100)	Q_{eff}	(GPM)	46.98	46.51	46.03	—	—	—	—	—	—
	P_a	(HP)	11.75	19.96	27.37	—	—	—	—	—	—

V3 VariableVanePump

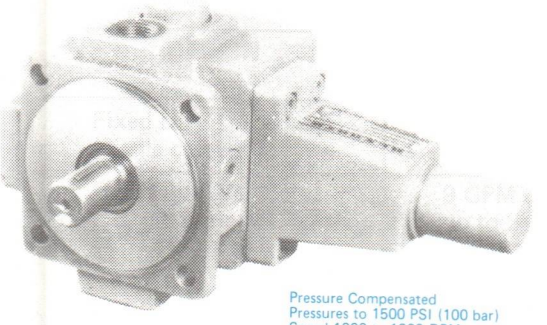
Hydraulic pumps type V3 are vane pumps of rotary vane design with variable displacement and adjustable maximum operating pressure.

The cam ring is of circular construction and is held in an eccentric position by the compensator spring. When the required maximum pressure setting is reached the cam ring moves against the compensator spring and reduces the flow to almost zero.

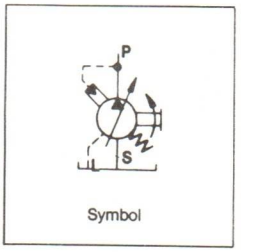
The set pressure is maintained and only the leakage oil is replaced.

Special Features

- automatic bleeding
- low noise level
- use of hydro-dynamically lubricated friction bearings give long bearing life
- bronze coated port plates, giving good sliding characteristics to reduce friction



Pressure Compensated
Pressures to 1500 PSI (100 bar)
Speed 1000 to 1800 RPM



Symbol

Size 12 to 63

Refer to **RA 10428, RA 10430 RA 10432** and **RA 10434**

Ordering Code (Foot bracket and handwheel to be ordered separately)

1 PV 2 V3—XX/12 R A12 M C 100 A 1/5

MOUNTING
2 = Flange
6 = Subplate

DESIGN SERIES

PUMP SIZE in³/rev (cm³/rev)
12 = 0.52 (12)
25 = 1.16 (25)
40 = 1.95 (40)
63 = 2.87 (63)

ROTATION
R = Right hand
L = Left hand
D = Double

CONNECTIONS 12 = SAE threads 8 = Subplate
A = Singleshaft F = Mid. Pump
E = Front Pump G = Rear Pump

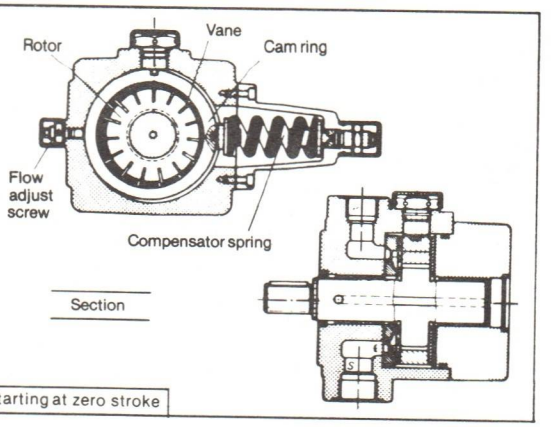
SEALS
M = Buna-N
V = Viton

CONTROLS
C = Adj. screw
H = Sq. end adj. screw
S = Lockable adj.

PRESS RANGE
25 = 375 PSI 63 = 900 PSI
40 = 600 PSI 100 = 1500 PSI

VOL ADJ
A = Adj. screw
H = Sq. end adj. screw S = Lockable adj.

Nominal displacement	0.52 in³/rev to 2.87 in³/rev			
Nominal flow	4.27 GPM to 22 GPM at n = 1800 RPM; p = 150 PSI			
Speed range	1000 to 1800 RPM			
Spring type	cont. pressure 25	40	63	100
PSI	180 to 370	300 to 600	450 to 1900	750 to 1500
Operating pressure - inlet	3 PSI (neg.) to 75 PSI (pos.)			
- outlet	max. 1500 PSI, continuous operating pressure			
- leakage port	max. 30 PSI			
Shaft loading	Radial and axial forces cannot be transmitted			
Mounting method	Face mounting			
Ports	Threaded connections			
Direction of rotation	clockwise			
Hydraulic medium	Mineral oils			
Fluid temperature range	+ 14 to + 160° F			
Filtration	25 µm			
Viscosity range	73 to 736 SSU at operating temperature and zero stroke pressure < 900 PSI; 115 to 736 SSU at operating temperature and zero stroke pressure > 900 PSI max. 3680 SSU when starting up when pump is delivering; max. 920 SSU when starting at zero stroke			



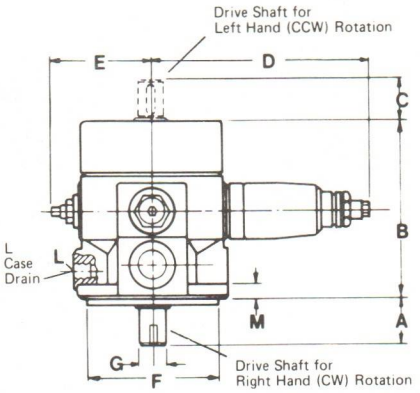
Section

Size 12 to 63
FLANGE MOUNTED

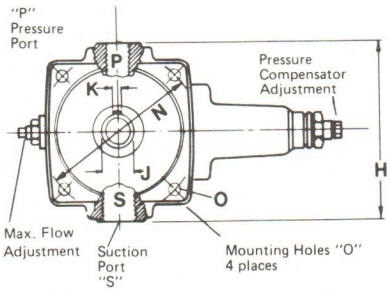
Dimensions inches (mm)

Note- Confirm critical dimensions with Rexroth Engineering

Pump Model No.	A	B	C	D	E	F--Pilot Dia. Max.	F--Pilot Dia. Min.	G--Shaft Dia. Max.	G--Shaft Dia. Min.	H
1PV2V3-30/12	1.20 (30.5)	4.02 (102)	1.22 (31)	6.14 (156)	2.70 (68.5)	3.149 (80hg)	3.145	0.749 (18)	0.748	4.45 (113)
1PV2V3-30/25 (See Pressure Rating)	1.36 (34.5)	5.28 (134) / 4.88 (124)	1.20 (30.5) / N/A	6.46 (164)	3.07 (78)	3.998 (101.6)	3.995			5.12 (130)
1PV2V3-30/40	2.05 (52)	6.54 (166)	1.89 (48)	8.07 (205)	3.86 (98)	4.998 (127)	4.994	0.998 (25)	0.997	7.48 (190)
1PV2V3-30/63	2.68 (68)	7.13 (181)	2.52 (64)	8.07 (205)	3.86 (98)			1.250 (31.8)	1.248	7.48 (190)



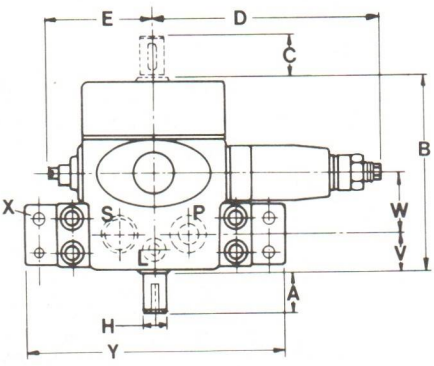
Shaft J	Key K	Face Mounting Flange M	Face Mounting Flange N-dia. ±0.008	Face Mounting Flange O--dia.	Porting--SAE or NPT L	Porting--SAE or NPT P	Porting--SAE or NPT S	Weight Lbs. (Kg)	Pump Shaft End Pressure Ratings Single	Pump Shaft End Pressure Ratings Double
0.811 (21)	0.125 (3)	0.32 (8)	3.937 (100+0.2)	0.394 (9)	7/16–20 SAE-2B	9/16–18 SAE-2B	3/4–16 SAE-2B	13.7 (6.25)	1500,900,600 or 375 psi	
		0.39 (10)	5.000 (127+0.2)	0.433 (11)	7/16–20 SAE-2B	3/4–16 SAE-2B	1-1/2–12 SAE-2B	24.4 (11.1)	1500 psi	1500,900, 600,or375
									900,600 or 375 psi	
1.039 (27)	0.187 (4.5)	0.39 (10)	6.375 (161.9+0.2)	0.551 (14)	9/16–18	1-1/16–12 SAE-2B	1-5/8–12 SAE-2B	59 (26.8)	1500,900,600, or 375 psi	
1.362 (34.7)	0.250 (6.3)	0.47 (12)		0.551 (14)	SAE-2B	1-5/16–12 SAE-2B	1-7/8–12 SAE-2B	(67) (30.5)	1500,900,600 or 375 psi	



Size 12 to 63
SUBPLATE MOUNTED

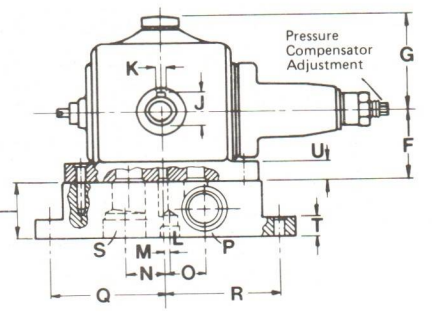
Note- Confirm critical dimensions with Rexroth Engineering

Pump Model No.	Pressure Ratings Pump Shaft End Single	Pressure Ratings Pump Shaft End Double	A	B	C	D	E	F ±0.004	G	H--Shaft Dia. Max.	H--Shaft Dia. Min.	Shaft J	Key K
1PV6V3-30/25	1500 psi	1500,900, 600,or 375 psi	1.10 (28)	5.63 (143) / 5.13 (130.5)	1.10 (28) / N/A	6.46 (164)	3.07 (78)	2.126 (54±0.1)	2.70 (68.5)	0.749 (18)	0.748	0.811 (21)	0.125 (3)
	900,600, 375 psi												
1PV6V3-20/40	1500,800,600, or 375 psi		1.65 (42)	7.17 (182)	1.65 (42)	8.07 (205)	3.85 (98)	2.953 (75±0.1)	3.86 (98)	0.998 (25)	0.997	1.039 (27)	0.187 (4.5)
1PV6V3-20/63	1500,900,600, or 375 psi		2.28 (58)	7.95 (202)	2.28 (58)	8.07 (205)	3.85 (98)	2.953 (75±0.1)	3.86 (98)	1.250 (31.8)	1.248	1.362 (34.7)	0.250 (6.3)



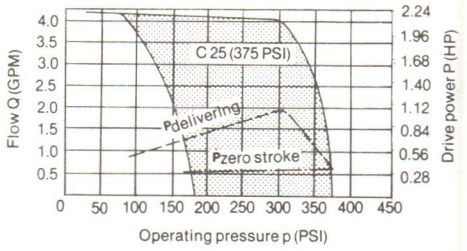
L Port	M	N	O	P Port	Q & R	S Suction	T	U	V	W	X--Dia. Holes	Y	Pump Weight Lbs. (Kg)
1/4 NPT	0.16 (4)	1.14 (29)	1.42 (36)	1/2 NPT	3.50 (89)	3/4 NPT	0.63 (16)	0.51 (13)	1.10 (28)	1.71 (43.5)	0.55 (14) 2 Places	8.27 (210)	24.2 (11)
3/8 NPT	0.20 (5)	1.69 (43)	1.30 (33)	3/4 NPT	4.53 (115)	1-1/4 NPT	0.75 (19)	0.75 (19)	1.46 (37)	2.13 (54)	0.43 (11) 4 Places	10.25 (260)	57.2 (26)
3/8 NPT	0.20 (5)	1.77 (45)	1.38 (35)	1" NPT	4.53 (115)	1-1/4 NPT	0.75 (19)	0.75 (19)	1.61 (41)	2.36 (60)	0.43 (11) 4 Places	10.25 (260)	66 (30)

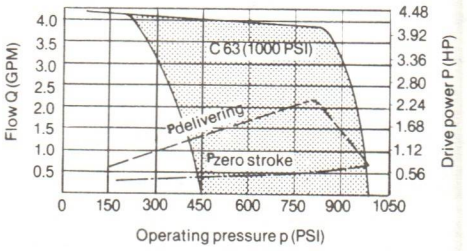
Dimensions inches (mm)

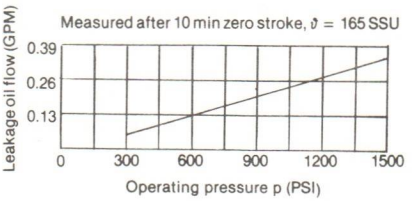


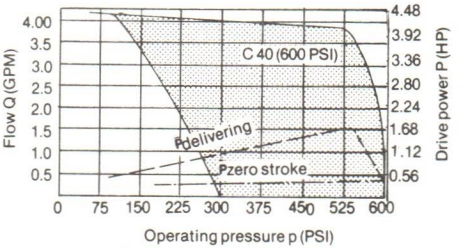
Pump Size	Part Number	Height
25	G182/184-8	2.375 (60.3)
	G213/215-8	3.125 (79.4)
40	G213/215-12	2.297 (58.3)
63	G213/215-20	2.297 (58.3)

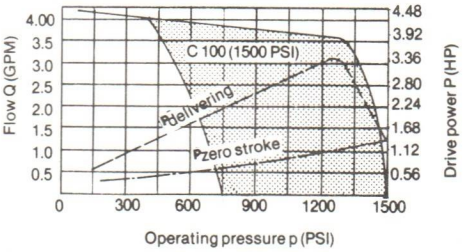
Size 12

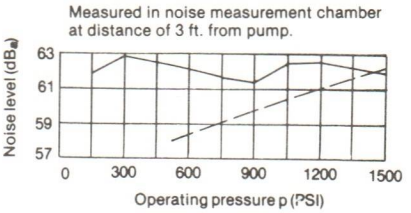






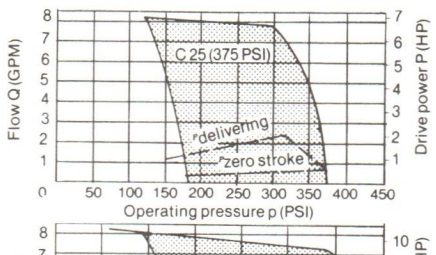


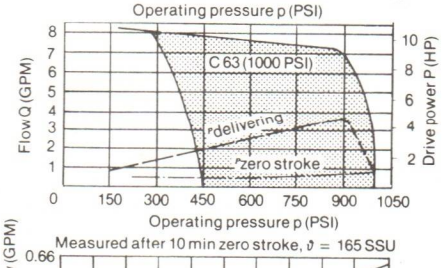


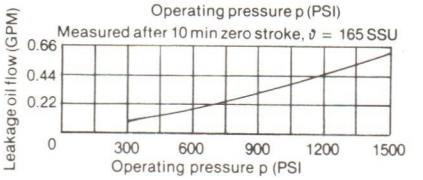


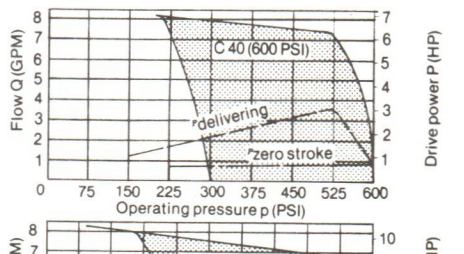
— Noise when delivering; — — Noise at zero stroke;

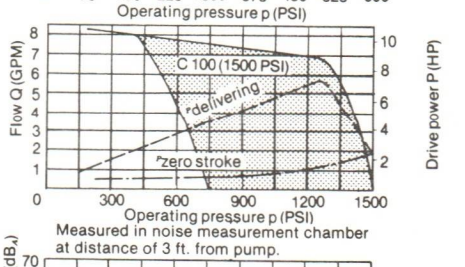
Size 25

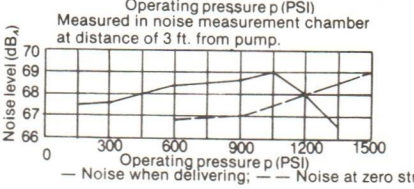






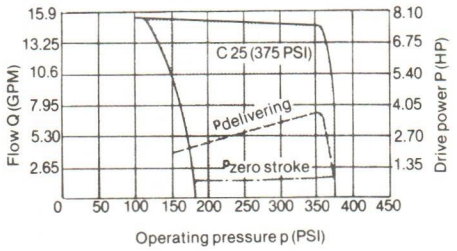


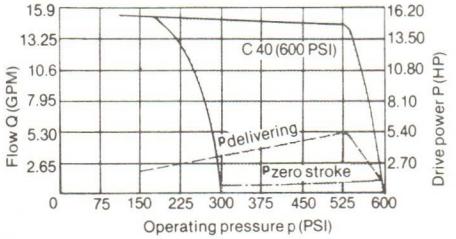


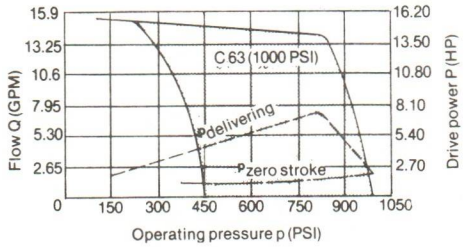


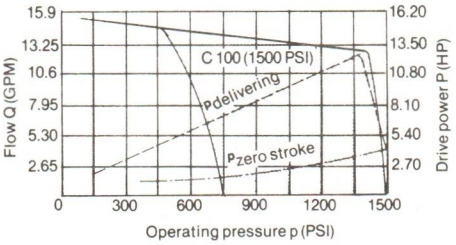
— Noise when delivering; — — Noise at zero stroke;

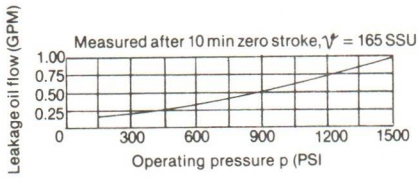
Size 40

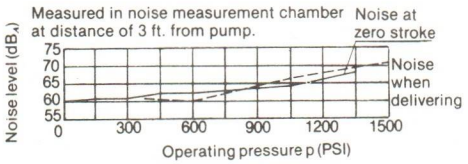




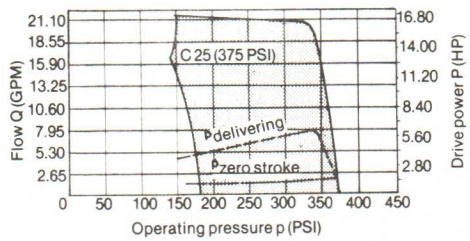


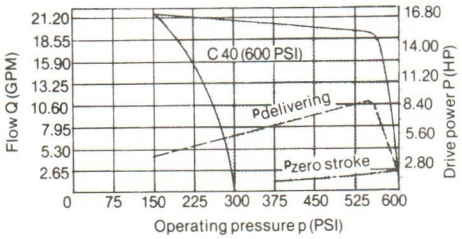


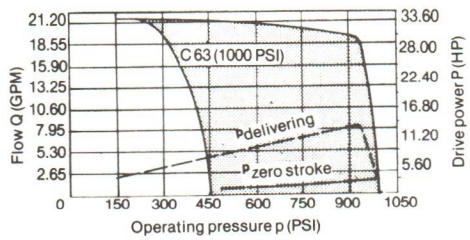


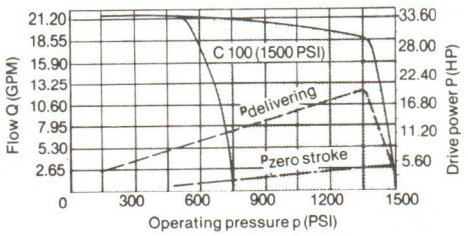

Measured in noise measurement chamber at distance of 3 ft. from pump.
Noise at zero stroke
Noise when delivering
Noise level (dBA)
Operating pressure p (PSI)

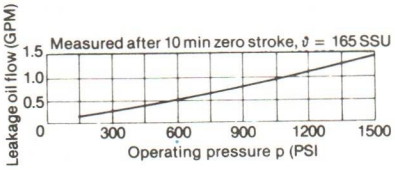
Size 63

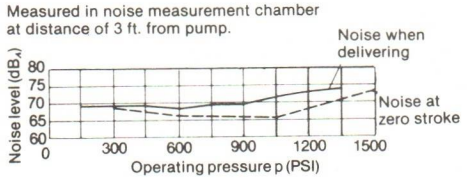











Measured in noise measurement chamber at distance of 3 ft. from pump.
Noise when delivering
Noise at zero stroke
Noise level (dBA)
Operating pressure p (PSI)

V4 VariableVanePump

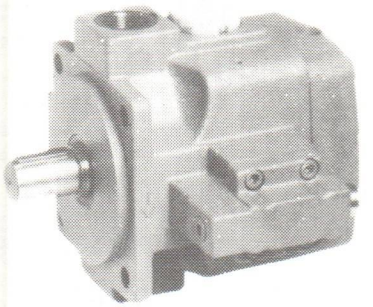
Hydraulic pumps type V4 are vane pumps with dual vanes and variable displacement. They comprise housing, rotor with dual vanes, cam ring, device for setting maximum displacement, pressure compensator to set the maximum operating pressure and automatic bleed valve.

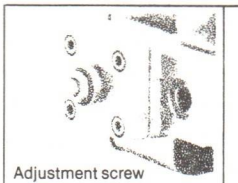
Two vanes move freely in each rotor section. This means good sealing between the individual chambers in any rotor position. Chamfering of the vanes provides a hydraulic balance. The resulting reduced pressure on the inside curve of the cam ring means less friction of the vanes on the cam and therefore a long working life of the pump is obtained.

Pressure Control

The circular cam ring is held between two spools affected by system pressure. A spring in spool II protects the function at start-up. When the set operating pressure is reached, the control spool moves and the chamber behind spool II is connected to the tank. Spool I thus causes the cam ring to move in such a way that the flow decreases to almost zero.
The set pressure is maintained and only the leakage and pilot oil replaced.

Remote Pressure Control
Adjustable pressure relief valves can be connected independently from one another by means of directional control valves. Programmed call-up of various zero stroke pressure is therefore possible.
The zero stroke pressure can be infinitely varied and/or programmed according to the electrical current by means of an electrically controlled pressure relief valve.





Adjustment screw for maximum flow adjustment

Symbol

Characteristics:

- high operational safety due to automatic bleeding
- low noise level
- maximum flow setting
- long service life of bearings, due to hydro-dynamically lubricated friction bearings bronze coated discs and plate cams.

Size 20 to 125

Refer to **RA 10448, RA 10450, RA 10452, RA 10454** and **RA 10456**

Ordering Code

1PV2V4— XX/32 R A 12 M C 160A1 5

DESIGN SERIES

PUMP SIZE in³/rev (cm³/rev)
20 = 1.22 (20)
32 = 1.95 (32)
50 = 3.05 (50)
80 = 4.88 (80)
125 = 7.63 (125)

SAE

SHAFT
A = Single
D = Double
E = Front
F = Mid
G = Rear

SEALS
M = Buna-N
V = Viton

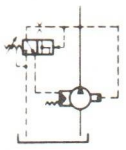
PRESSURE CONTROLS
C = Press. comp. w/mech. adj.
D = Press. comp. for remote cont.
W = 2 stage press. comp. w/sol. cont.
E = Press. comp. w/electronic press. cont.
N = Flow comp. w/mech. flow adj.
J = Flow comp. w/elec. remote
T = Flow/press. comp. w/hyd. remote
R = Flow/press. comp. w/elec. remote
F = Flow/press. comp. w/elec. remote
L = HP control

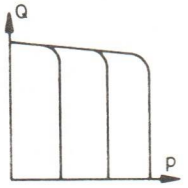
Nominal displacement (in³/rev)		1.2 to 7.63		
Nominal flow (GPM)		9 GPM to 59 GPM at N = 1800 RPM; P = 145 psi		
Speed range (RPM)		1000 to 1800		
Pressure nominal value (PSI)		914	1450	2320
optimum set value (PSI)		218 ... 914	580 ... 1450	900 ... 2400
Operating pressure	— inlet (PSI)	3 (neg.) ... 22 (pos.)		
	— outlet (PSI)	continuous operating pressure 2400		
	— leakage port	2 BAR 30 PSI		
Mounting position / Mounting method		optional / flange mounting - **SAE**		
Shaft loading		radial and axial forces cannot be transmitted		
Pipe connection		threaded connections		
Direction of rotation		clockwise		
Hydraulic medium		mineral oils, phosphate ester		
Fluid temperature (°F) 14° ... 160°F Viscosity range		80-730 SSU at op. temp. and zero stroke pressure < 2320 PSI; max. 3625 SSU when starting up when pump is delivering; max. 925 SSU when starting up at zero stroke		148-730 SSU at op. temp. and zero stroke pressure > 2320PSI
Required Filtration µm		25		

For applications to other specifications, please consult us.

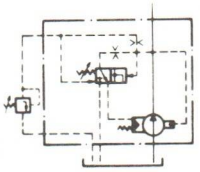
Size 20 to 125

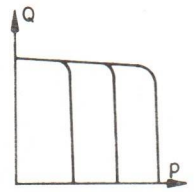
PRESSURE CONTROLLER
with mechanical
pressure
adjustment "C"



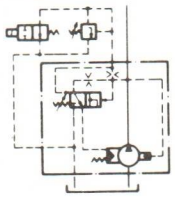


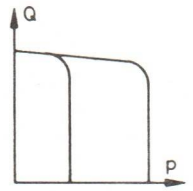
PRESSURE CONTROLLER
with hydraulic
remote
pressure control "D"



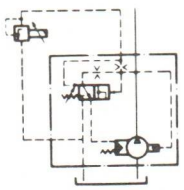


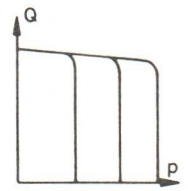
PRESSURE CONTROLLER
with electrical
two-stage
pressure control "W"



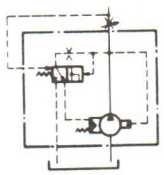


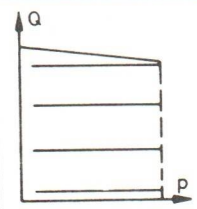
PRESSURE CONTROLLER
with electrical
remote
pressure control "E"



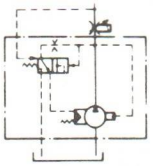


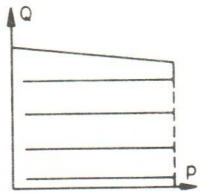
FLOW CONTROLLER
with mechanical
flow
adjustment "N"



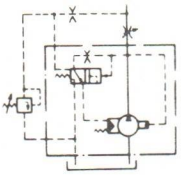


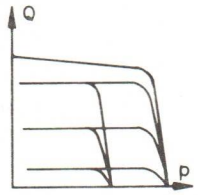
FLOW CONTROLLER
with electrical
remote
flow control "J"



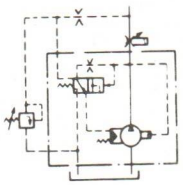


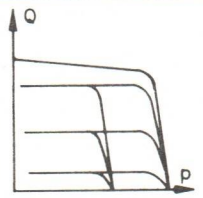
FLOW — PRESSURE CONTROLLER
single model with mechanical
flow adjustment and hydraulic
remote pressure control "T"



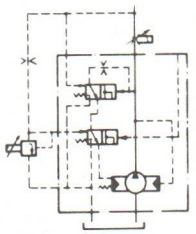


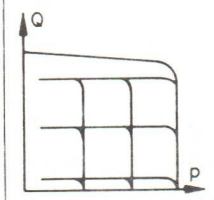
FLOW—PRESSURE CONTROLLER
single model with electrical
flow adjustment and hydraulic
remote pressure control "R"





FLOW—PRESSURE CONTROLLER
with electrical remote
control of flow and
pressure "F"

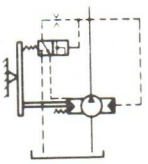


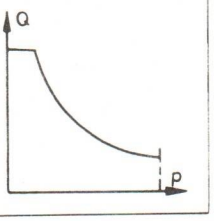


HP CONTROL
"L"
with details of the
desired performance
curve, e.g. for 5 kW
"L5"

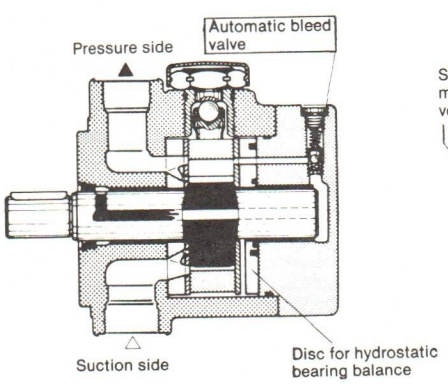
Control ranges:

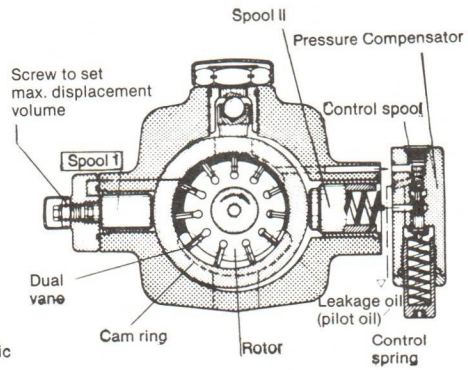
1	2	-	3.5	kW
1	3.5	-	5	kW
111	5	-	6.5	kW

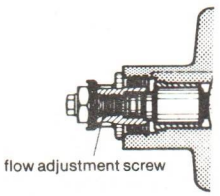




Section







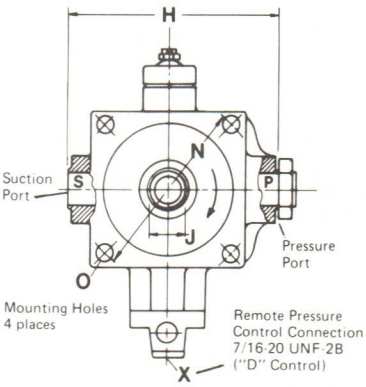
Size 20 to 125

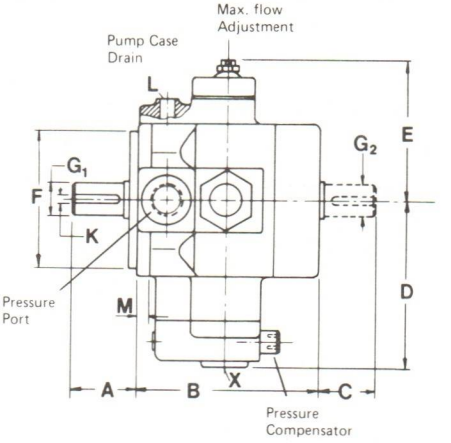
FLANGE MOUNTED

Dimensions inches (mm)

Pump Model No.	A	B	C	D	E	F--Pilot Dia. Max.	F--Pilot Dia. Min.	G1--Shaft Dia. Max.	G1--Shaft Dia. Min.	H
1PV2V4-1X/20	2.05 (52)	6.46 (164)	1.73 (44)	5.95 (151)	5.91 (150)	4.000 SAE B	3.998	1.000 (25)	0.998	6.00 (178)
1PV2V4-2X/32	2.72 (69)	7.20 (183)	2.28 (58)	6.38 (162)	5.91 (150)	5.000 SAE C	4.998	1.250 (32)	1.248	7.10 (205)
1PV2V4-2X/50	2.67 (68)	8.46 (216)	2.28 (58)	6.77 (172)	6.42 (163)	5.000 SAE C	4.998	1.500	1.498	8.15 (207)
1PV2V4-2X/80RA	2.95 (58)	8.26 (220)		6.93 (176)	6.89 (175)	6.000 SAE D	5.998	1.500 (38)	1.498	9.48 (241)
1PV2V4-2X/80RD	3.45 (87.3)		2.38 (61)					1.625 (41)	1.623	
1PV2V4-2X/125	3.64 (92.5)	10.63 (270)	3.53 (90)	9.33 (237)	8.39 (213)	7.874	7.871	1.750 (44)	1.748	9.77 (248)

Key Way J	Key Way K	Face Mounting Flange M	N--dia. ±0.008	O-dia.	Porting--SAE L	Porting--SAE P	Porting--SAE S	G2--Shaft Dia. Max.	G2--Shaft Dia. Min.
1.039	0.187	0.43 (11)	5.00 (127)	0.56 (14)	9/16–18 UNF-2B	3/4–16 UNF-2B	1-3/16–12 UN-2B	1.000	0.998
1.362	0.251	0.48 (12)	6.37 (160)	0.56 (14)	9/16–18 UNF-2B	1-1/16–12 UN-2B	1-5/8–12 UN–2B	1.250	1.248
1.664	0.376	0.49 (12.5)	6.37 (160)	0.56 (14)	9/16–18 UNF-2B	1-5/16–12 UN-2B	1-7/16–12 UN-2B	1.500	1.498
1.664	0.376	0.57 (14.5)	9.00 (228)	0.79 (18)	3/4–16 UNF-2B	1-5/8–12 UN-2B	2" SAE 3000 PSI Flg.	1.500	1.498
1.921	0.376	0.99 (25)	9.84 (250)	0.87 (22)	1-5/16–12 UN-2B	1-1/2 SAE 3000 PSI Flg.	2-1/2 SAE 3000 PSI Flg.	1.750	1.748





Performance Curves (measured at n = 1800 rpm; ϑ = 165 SSU; t = 120 °F)

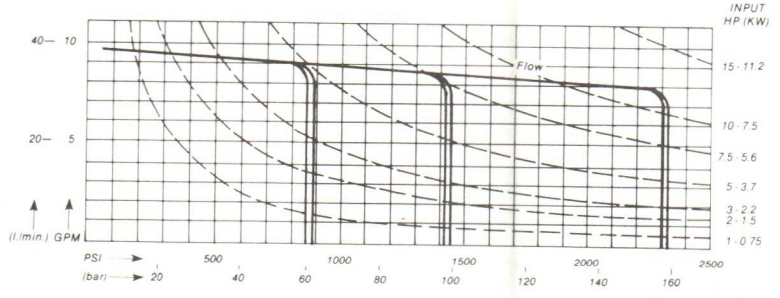
Size 20

When choosing the pressure rating please note:
Adjustment is carried out so that the most favorable noise level occurs at the highest zero stroke pressure. The pressure controller is identical for all pressure ratings.

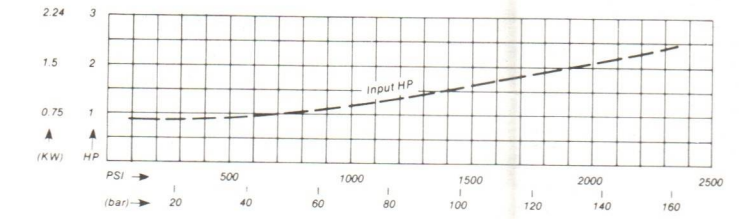
NOTE: Performance based on 90% efficiency (average).

TO USE THE CURVES:
Locate the point of pressure (PSI) and flow (GPM). Input horsepower required can then be read directly from the horsepower curves.

FULL FLOW and INPUT HP



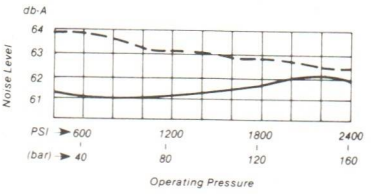
DEAD HEAD H.P.



Sound level readings were conducted in a sound room, at a distance of 3 feet (1 meter) from the pump. (DIN43635)

The REXROTH V4 pumps have a sound level tuning adjusting device. The adjustment is made for the highest dead head pressure. The adjusting screw and lock is located behind the pressure discharge port. Maximum adjustment must not exceed 60° either side of the factory marking.

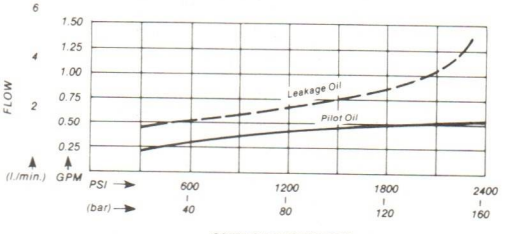
Graph Code: _____ *noise at zero stroke*
_____ *noise at full delivery*



PILOT OIL REQUIRED for the remote pressure controls "D", "W", "E", "T", "R", or "F"

NOTE: the PILOT OIL requirements must be added to the pump leakage oil.

PILOT OIL & LEAKAGE CONSUMPTION

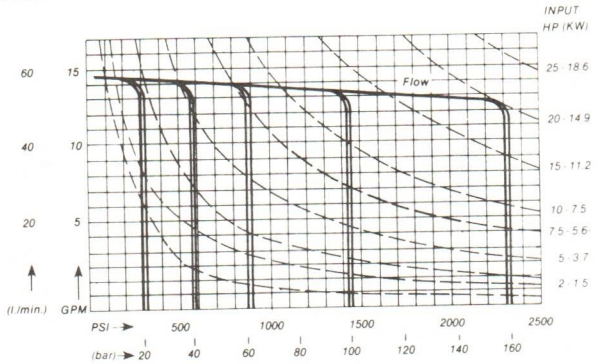


Size 32

NOTE: Performance based on 90% efficiency (average).

TO USE THE CURVES:
Locate the point of pressure (PSI) and flow (GPM). Input horsepower required can then be read directly from the horsepower curves.

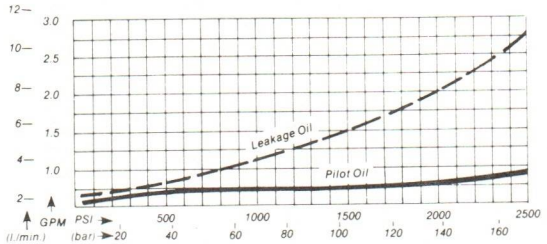
FULL FLOW and INPUT HP



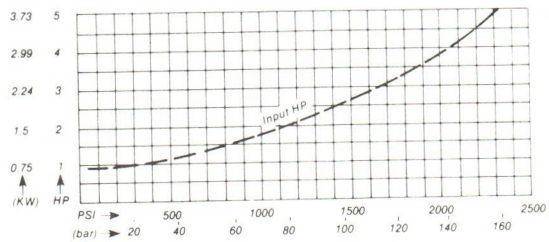
PILOT OIL REQUIRED for the remote pressure controls "D", "W", "E", "T", "R", or "F"

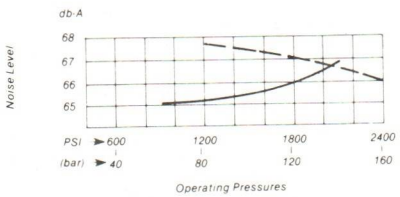
NOTE: the PILOT OIL requirements must be added to the pump leakage oil.

PILOT OIL & LEAKAGE CONSUMPTION



DEAD HEAD H.P.

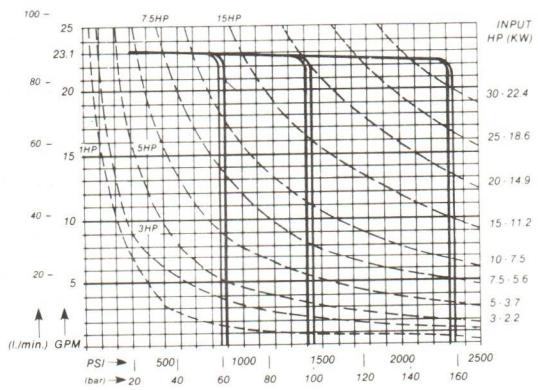




Size 50

NOTE: Performance based on 90% efficiency (average).

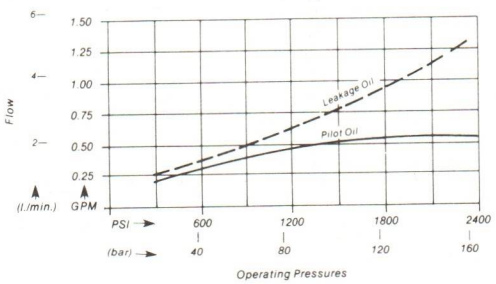
FULL FLOW and INPUT HP



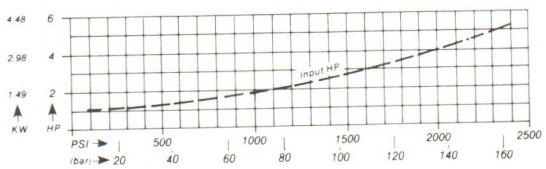
PILOT OIL REQUIRED for the remote pressure controls "D", "W", "E", "T", "R", or "F"

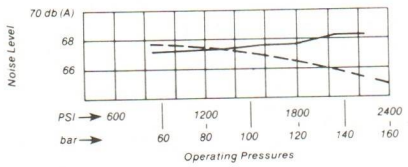
NOTE: the PILOT OIL requirements must be added to the pump leakage oil.

PILOT OIL & LEAKAGE CONSUMPTION



DEAD HEAD H.P.





Size 80

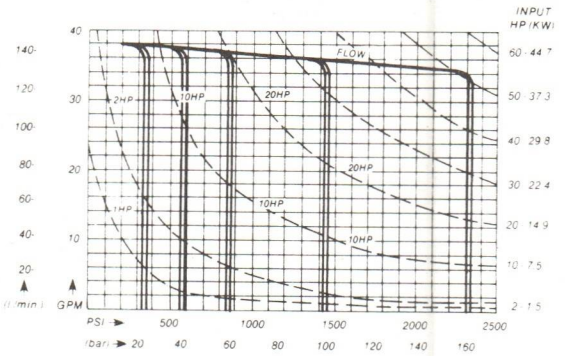
NOTE: Performance based on 90% efficiency (average).

TO USE THE CURVES:
Locate the point of pressure (PSI) and flow (GPM). Input horsepower required can then be read directly from the horsepower curves.

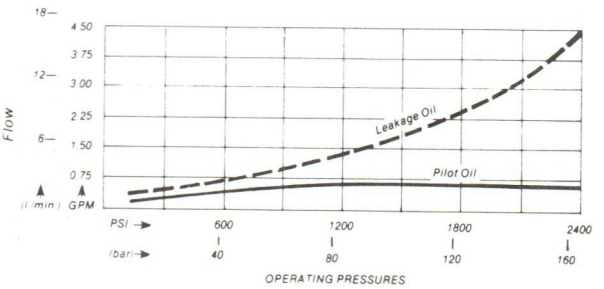
PILOT OIL REQUIRED for the remote pressure controls "D", "W", "E", "T", "R", or "F"

NOTE: the PILOT OIL requirements must be added to the pump leakage oil

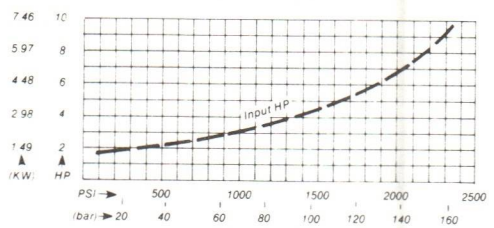
FULL FLOW and INPUT HP

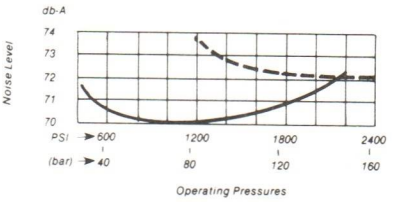


PILOT OIL & LEAKAGE CONSUMPTION



V4-80 @ 1750 RPM
DEAD HEAD HP (Leakage Holding Stroke)





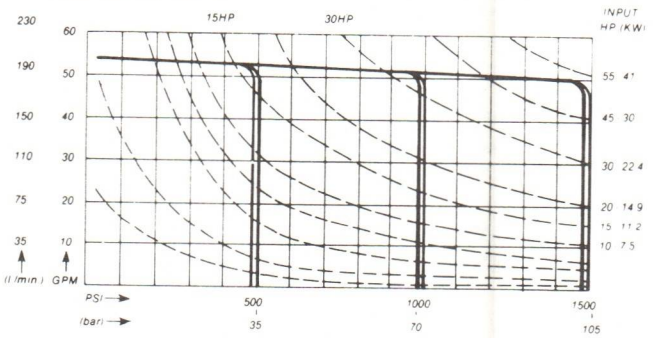
Size 125

TO USE THE CURVES
Locate the point of pressure (PSI) and flow (GPM). Input horsepower required can then be read directly from the horsepower curves.

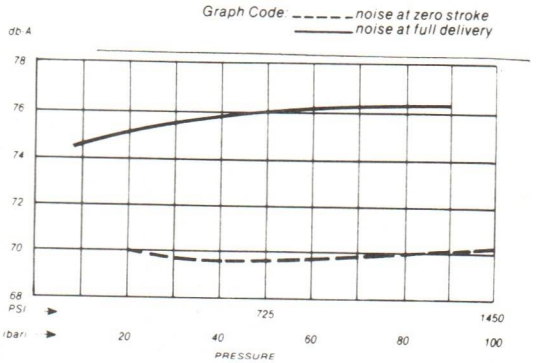
NOTE: Performance based on 85% efficiency (average).

SOUND RATINGS: Sound level readings were conducted in a sound room, at a distance of 3 feet (1 meter) from the pump. (DIN43635)

FULL FLOW and INPUT HP

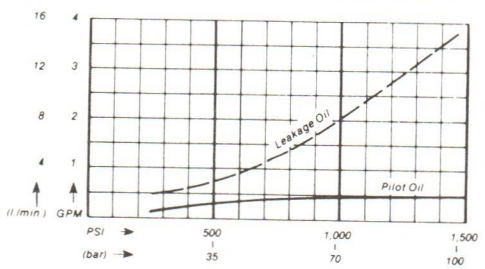


PRESSURE RATINGS to 1450 PSI

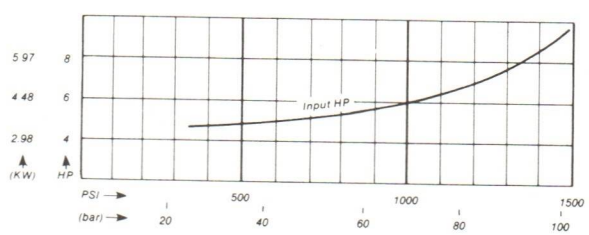


PILOT OIL & LEAKAGE CONSUMPTION

PILOT OIL REQUIRED for the remote pressure controls "D", "W", "E", "T", "R", or "F"



DEAD HEAD H.P.



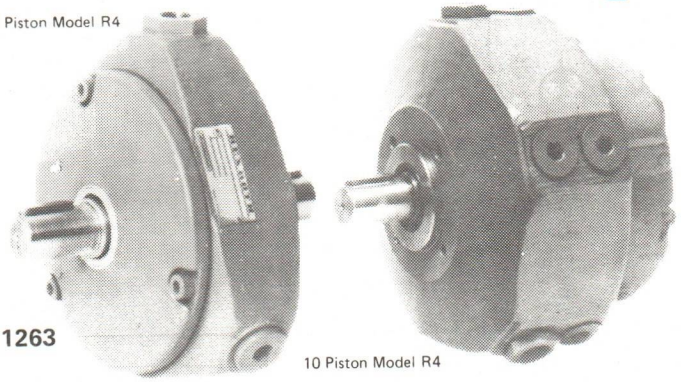
R4 RadialPistonPump

The REXROTH R4 pump is a fixed displacement piston pump, available in 3, 5 or 10 piston models. The pistons are arranged in a radial design and driven by an eccentric drive shaft. Suction and pressure valves are contained in the piston cartridge assembly.

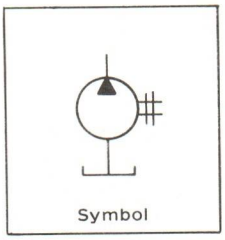
The pumps are self-priming and are capable of creating a vacuum of 3 PSI (0.2 bar) under atmospheric pressure. The case pressure on the suction side of the pump is allowable to a positive pressure of 22 PSI (1.5 bar).

The R4 hydraulic pump is extremely quiet in operation with a rating below 75 db (A) at its maximum operating pressure.

3 Piston Model R4



10 Piston Model R4



Size 3,5&10 Refer to RA 11263

Ordering Code (mounting hardware to be ordered separately)

1 PF1R4—XX/10.00—500 R A 12 M 01/5

DESIGN SERIES

PUMP SIZE

in^3/rev Displacement

3 Piston	Order Code	GPM/PSI @ 1750 RPM
0.092	**1.60-700**	0.70/10,150
0.131	**2.00-700**	0.87/10,150
0.158	**2.50-700**	1.08/10,150
0.207	**3.15-500**	1.36/7,250
0.294	**5.00-500**	2.16/7,250
0.356	**6.30-500**	2.72/7,250
5 Piston		
0.218	**3.15-700**	1.36/10,150
0.264	**4.00-700**	1.73/10,150
0.490	**8.00-500**	3.46/7,250
0.593	**10.00-500**	4.33/7,250
10 Piston		
0.306	**5.00-700**	2.16/10,150
0.436	**6.30-700**	2.72/10,150
0.527	**8.00-700**	3.46/10,150
0.981	**16.00-500**	6.93/7,250
1.186	**20.00-500**	8.66/7,250

SHAFT

A = Single G = Rear Pump

D = Double

SEALS

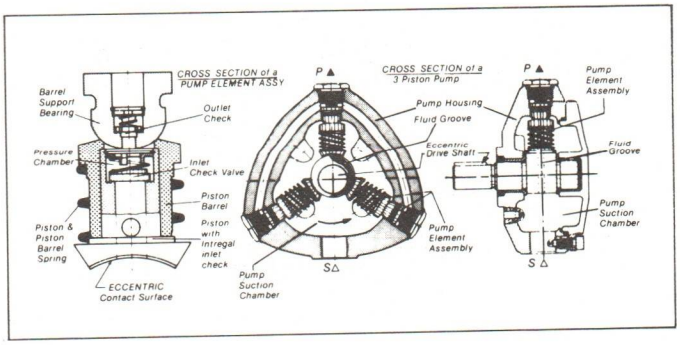
M = Buna-N

V = Viton

Technical Data

	3 Piston	5 Piston	10 Piston
Nominal Displacement (in3/rev)	from 0.09 to 0.35	0.2 to 0.59	0.3 to 1.18
Nominal Flow, 1750 RPM, Theoretical, GPM	0.7 to 2.7	1.6 to 4.49	2.3 to 8.98
Estimated Weight	15 lbs (6.8kg)	19 lbs (8.6kg)	28 lbs (12.7kg)
Speed Range	1000 to 2000 RPM (1800 RPM Nominal)		
Pressure Rating, psi (bar)	7250 (500) to 10,150 (700) varies with size		
Maximum Case Pressure (at inlet port)	22 psi (1.5 bar)		
Maximum Inlet Vacuum	6" hg (0.2 bar)		
Drive Speed Range	1000 to 2000 RPM (1800 RPM Nominal)		
Direction of Rotation	Clockwise		
Hydraulic Medium	Petroleum-based hydraulic oil (Buna-N Seals)		
Operating Temperature	-40°F to 160°F (-40°C to +70°C)		
Viscosity Range	60 SSU (10 c st) to 930 SSU (200 c st)		
Load Limitations	Overhung loads not recommended		
Mounting Method	Face mount or foot mounting bracket optional		
Ports	SAE threaded suction and pressure ports		
Filtration	40 µm		

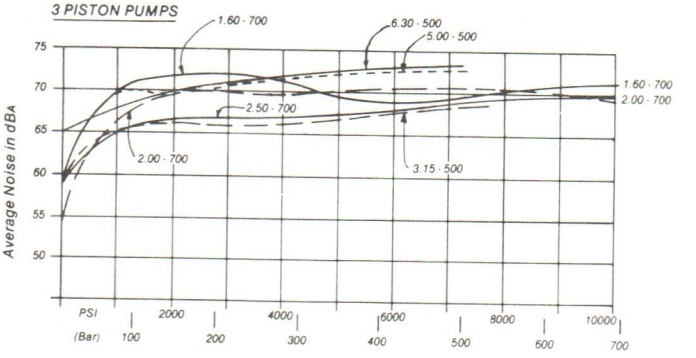
Section



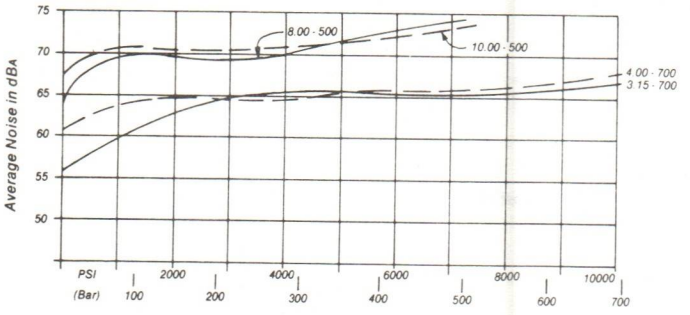
Performance Curves are based on full flow of the pump. Multi-circuit application pumps will differ from curves shown below.
Sound Level readings were conducted in a sound room, at a distance of 3 feet (1 meter) from the pump (DIN 45 635) Numbers shown on the curve Lines correspond to the Ordering Code number.

Test speeds –1800 RPM
Fluid –172 SSU (36 c st.) at 120°F (50°C)

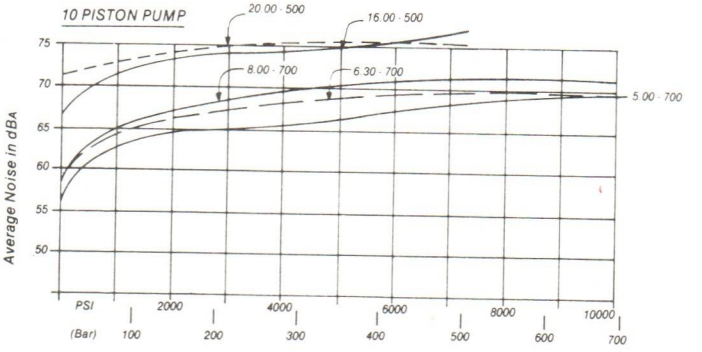
3 PISTON PUMPS



5 PISTON PUMP

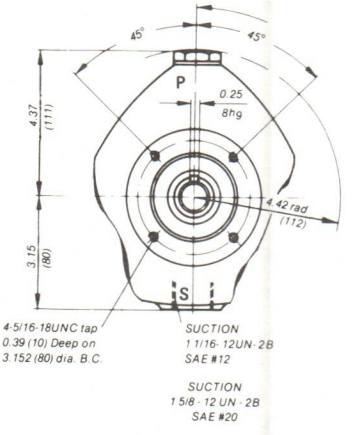


10 PISTON PUMP

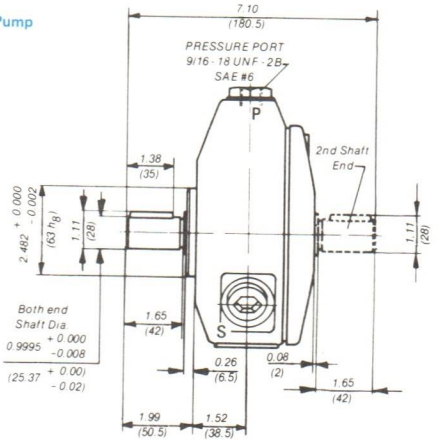


Dimensional Data, Model R4

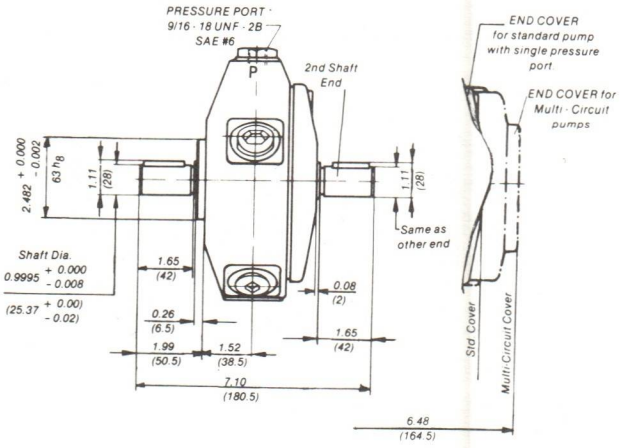
NOTE: *Pressure Ports on the Standard R4 pumps and the Multi-circuit pumps are the same size. Only one suction port on all pumps.*



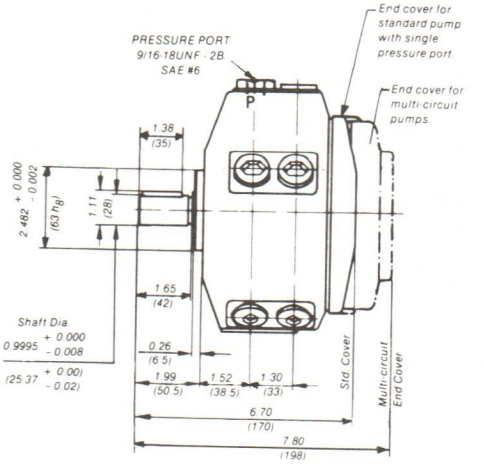
3 3 Piston Pump



5 5 Piston Pump

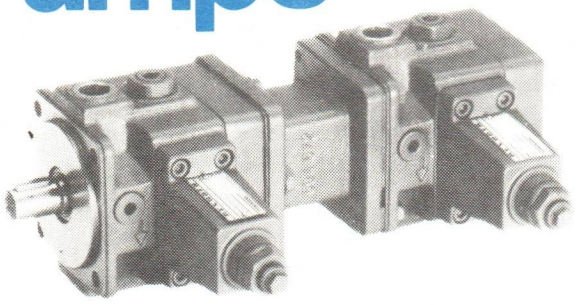


10 10 Piston Pump



CombinationPumps

Combination pumps from the V2, V3 & V4
range are particularly suited
for the machine tool industry
The combination V2 & R4 — V3 & R4 or V4 & R4
is available for high/low systems
Request engineering sheet: RA 11827, RA 11828



V2R4

For complete Engineering specifications, contact
Rexroth Engineering, Bethlehem.

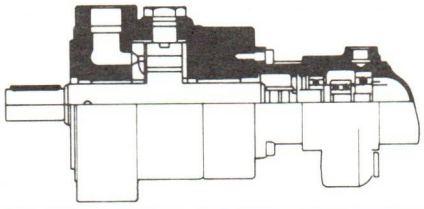
Order Code (Refer to individual pump model codes for complete specifications).

1 PF 2V2—XX/16.6 R D D 1 M E (PLUS) + 1 PF/ R4—XX/4.00—700 R A 12 M 01 G/5

FRONT PUMP
FOR DETAILS OF MODEL CODE SEE V2 PUMP PAGE

REAR PUMP
FOR DETAILS OF MODEL CODE SEE R4 PUMP PAGE
REFER TO RA 10336, RA 10337, and RA 11263

V3R2



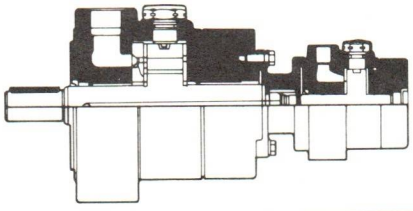
Order Code (Refer to individual pump model codes for complete specifications).

1PV2V3—XX/25 R 3 M C 100 A 1E/5 (PLUS) + 1PFR2—X/3—0.39—0.89 MG/5

FRONT PUMP
FOR DETAILS OF MODEL CODE SEE V3 PUMP PAGE

REAR PUMP
FOR DETAILS OF MODEL CODE
REFER TO RA 11828

V3V3



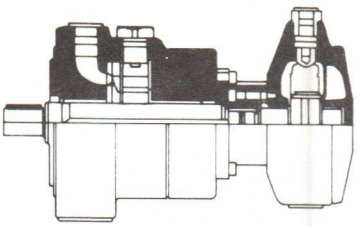
Order Code (Refer to individual pump model codes for complete specifications).

1PV2V3—XX/25 R 3 M C 100 A 1E/5 (PLUS) + 1PV2V3—XX/25 R 3 M C 100 A 1G/5

FRONT PUMP
FOR DETAILS OF MODEL CODE SEE V3 PUMP PAGE

REAR PUMP
FOR DETAILS OF MODEL CODE SEE V3 PUMP PAGE

V3R4



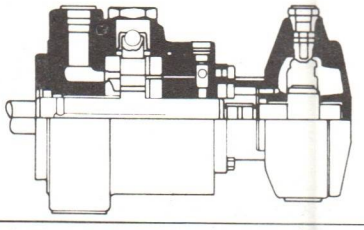
Order Code (Refer to individual pump model codes for complete specifications).

1PV2 V3—XX/40 R 3 M C 100 A 1E/5 (PLUS) + 1 PF/R4—XX/5.00—500 RA 12 M 01G/5

FRONT PUMP
FOR DETAILS OF MODEL CODE SEE V3 PUMP PAGE

REAR PUMP
FOR DETAILS OF MODEL CODE SEE R4 PUMP PAGE
REFER TO RA 11263

V4R4



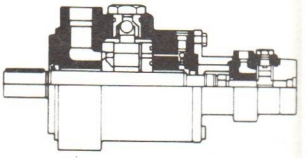
Order Code (Refer to individual pump model codes for complete specifications).

1PV2V4—XX/50RA 12 M C 160 A1E/5 (PLUS) + 1 PF/R4—XX/5.00— 700 RA 12 M 01G/5

FRONT PUMP
FOR DETAILS OF MODEL CODE SEE V4 PUMP PAGE

REAR PUMP
FOR DETAILS OF MODEL CODE SEE R4 PUMP PAGE

V4V3



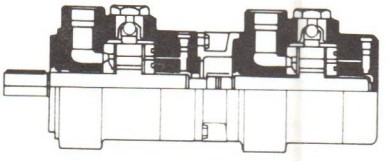
Order Code (Refer to individual pump model codes for complete specifications).

1PV2V4—XX/50RA 12 M C 160 A1E/5 (PLUS) + 1PV2V3—XX/25 R 3 M C 100 A 1E/5

FRONT PUMP
FOR DETAILS OF MODEL CODE SEE V4 PUMP PAGE

REAR PUMP
FOR DETAILS OF MODEL CODE SEE V3 PUMP PAGE

V4V4



Order Code (Refer to individual pump model codes for complete specifications).

1PV2V4—XX/50RA 12 M C 160 A1E/5 (PLUS) + 1PV2V4—XX/50RA 12 M C 160 A1E/5

FRONT PUMP
FOR DETAILS OF MODEL CODE SEE V4 PUMP PAGE

REAR PUMP
FOR DETAILS OF MODEL CODE SEE V4 PUMP PAGE

A2F Axial Piston Pump/Mtr.

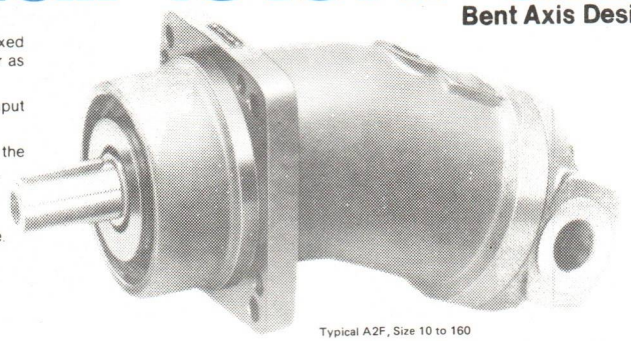
Bent Axis Design

The Axial Piston unit of the product group A2 with fixed displacement can operate either as a Hydro-pump or as a Hydro-motor.

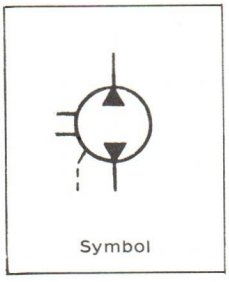
If used as a pump, the flow is proportional to the input speed and to the displacement.

If used as a motor, the output speed is proportional to the consumption capacity and vice versa proportional to displacement.

The output torque increases with the differential pressure (Δp) between the high and low pressure side.



Typical A2F, Size 10 to 160



Refer to
RA 13210

Size 10 to 160

Ordering Code (mounting hardware to be ordered separately)

A2F 55 R X P 1

PUMP SIZE in^3/rev

10	=	0.5
12	=	0.7
23	=	1.3
28	=	1.7
45	=	2.7
55	=	3.3
63	=	3.8
80	=	4.8
107	=	6.5
125	=	7.6
160	=	9.7

ROTATION

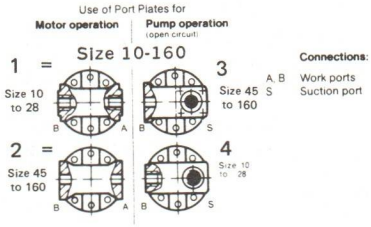
R	=	Clockwise
L	=	Counterclockwise
W	=	Bidirectional (Not for open circuit design)

DESIGN SERIES

SHAFT END

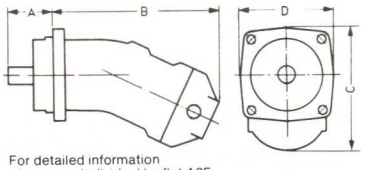
P	=	Keyed
Z	=	Splined

PORT PLATE



Technical Data

Size	Size	10	12	23	28	45	55	63	80	107	125	160
Displacement	in^3/rev	0.57	0.71	1.38	1.71	2.70	3.34	3.84	4.88	6.52	7.26	9.76
Max. speed closed circuit n_c max.	rpm	7500	6000	5600	4750	4500	3750	4000	3350	3000	3150	2650
Max. speed open circuit[1] n_{oc} max.	rpm	5000	4000	4000	3000	3000	2500	2700	2240	2000	2240	1750
Flow/consumption at n_c max.	gpm	18.2	18.4	33.5	35.2	52	54.2	66.1	70.8	84.7	103.2	112
Flow[2] at n_{oc} max.	gpm	11.7	11.8	23.6	21.9	34	35.1	44.3	45.9	54.8	71.8	71.7
Weight (approx.)	lbs	12	12	27	27	50	50	72	72	97	139	139
Dimension A (approx.)	inches	3.0	3.0	4.0	4.0	4.7	4.7	4.5	4.5	6.0	5.0	5.0
	mm	80	80	100	100	123	123	102	102	160	130	130
Dimension B (approx.)	inches	6.0	6.0	7.5	7.5	10	10	13.5	12.5	12.5	16.5	16.5
	mm	155	155	196	196	261	261	350	350	320	422	422
Dimension C (approx.)	inches	4.5	4.5	5.5	6.0	7.0	7.5	8.0	8.5	9.5	10.7	11
	mm	117	123	147	154	185	193	209	223	244	264	279
Dimension D (approx.)	inches	3.5	3.5	4.5	4.5	5.5	5.5	6.5	6.5	7.5	8.0	8.0
	mm	95	95	118	118	150	150	165	165	190	210	210

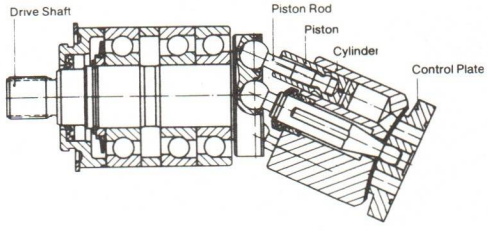


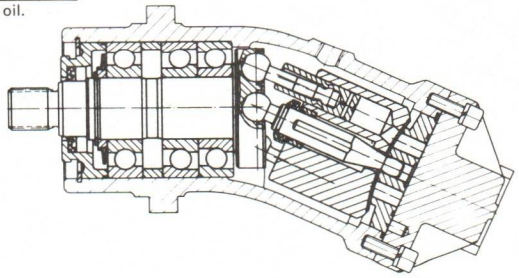
For detailed information please see individual leaflet A2F

1) Provided there is an absolute pressure of 14.5 psi (overpressure 0 psi) at suction inlet S and when operated on mineral oil.

2) 3% displacement losses included

By turning the drive shaft, the cylinder is put into motion via the piston/piston rods. A piston stroke occurs when turning the drive shaft and simultaneously swivelling the cylinder around angle alpha. The stroke increases as the swivel angle increases. The control plate has two kidney shaped slots through which the pressure fluid is fed in and discharged.





Ordering Code (mounting hardware to be ordered separately)

Size 200 to 1000

A2F 500 L X P 2

PUMP SIZE in³/rev

200	=	12.1
250	=	15.2
355	=	21.6
500	=	30.4
710	=	43.2
1000	=	60.9

ROTATION

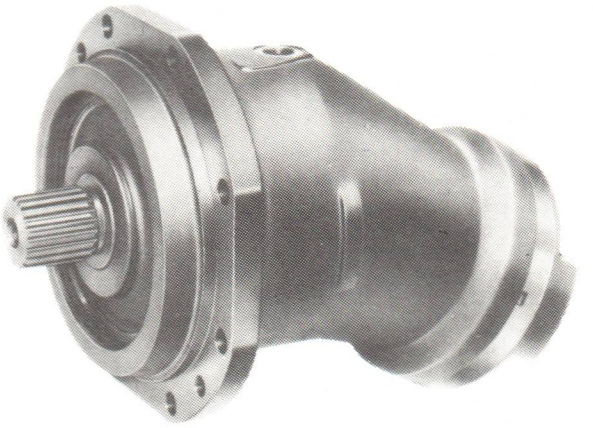
R	=	Clockwise
L	=	Counterclockwise
W	=	Bidirectional (Not for open circuit design)

DESIGN SERIES

SHAFT END

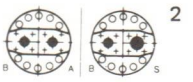
P	=	Keyed
Z	=	Splined

PORT PLATE



Use of Port Plates for

Motor operation	Pump operation (open circuit)
1	2



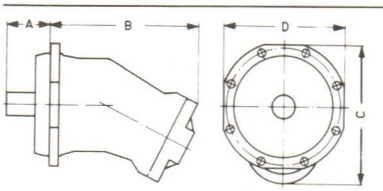
Connections:

A, B Work ports
S Suction port

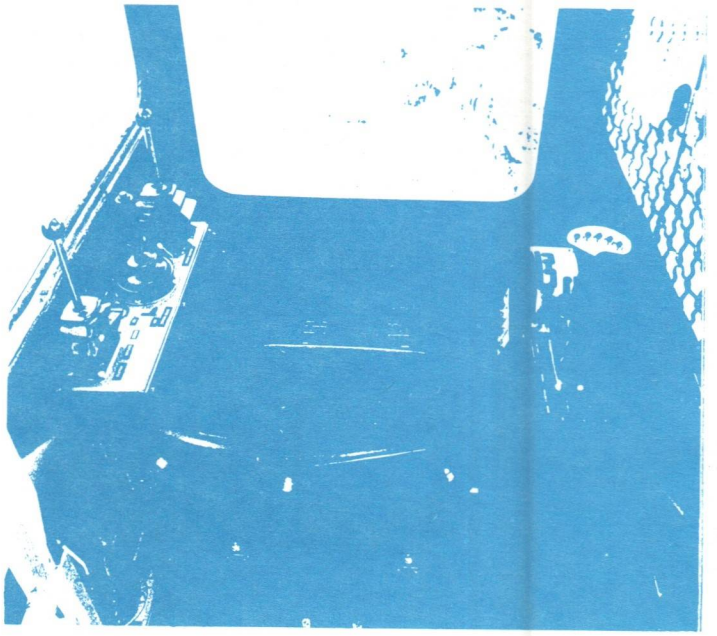
Technical Data

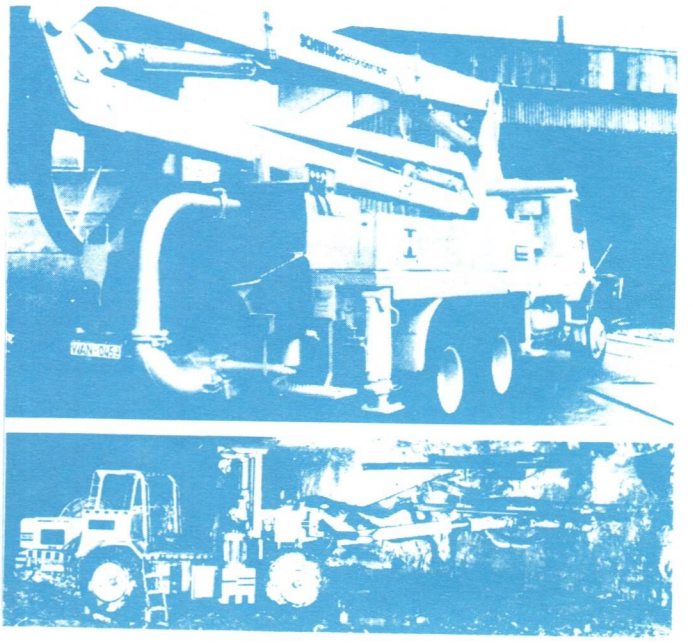
Size	Size	200	250	355	500	710	1000
Displacement	in³/rev	12.2	15.3	21.7	30.5	43.3	61.0
Max. speed closed circuit n_c max.	rpm	2500	2500	2240	2000	1600	1600
Max. speed open circuit[1] n_{oc} max.	rpm	1900	1500	1320	1200	1320	950
Flow/consumption at n_c max.	gpm	132	165	210	264	300	422
Flow[2] at n_{oc} max.	gpm	97	96	120	154	240	243
Weight (approx.)	lbs				410		
Dimension A (approx.)	inches	4.0	4.0	5.0	5.0	7.0	7.0
	mm	108	108	132	132	180	180
Dimension B (approx.)	inches	14.5	14.5	16.5	18.0	23	23.2
	mm	368	370	422	462	590	595
Dimension C (approx.)	inches	11.5	12.0	15.0	16.5	20	20.5
	mm	300	314	380	420	510	530
Dimension D (approx.)	inches	9.0	9.0	13.0	14.5	18	18
	mm	252	252	335	375	465	465

1) Provided there is an absolute pressure of 14.5 psi (overpressure 0 psi) at suction inlet S and when operated on mineral oil.
2) 3% displacement losses included



For detailed information
please see individual leaflet A2F, Series 5

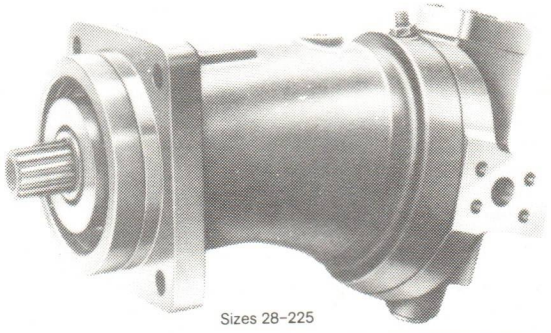




A6V AxialPistonMotor

The A6V variable displacement motor was specifically designed for hydrostatic drives requiring secondary adjustments. A number of adjustments are available on the motor giving it versatility, while maintaining its compact size.
Adjustment of the motor functions is accomplished by varying the oil consumption of the motor. This is done by changing the rotary group angle (α_{max} = 25° α_{min} = 7°, total swivel angle 18°).
At constant pressure and flow increasing the rotary group angle increases oil consumption. This results in decreased shaft speed and increased torque.

Size 28 to 225



Sizes 28–225

Design Features

- Volume Ratio: V_{max} to V_{min} = 3,47 to 1
- Compact Size, comparable in size to fixed displacement motors of same displacement.
- Bent Axis Design.
- Spherical Control Plate therefore moment free positioning of the cylinder.
- Piston and Piston Rod connection through cold forming process (without pin).
- Steel cylinder with bronze coated bearing surface.
- Drive shaft capable of taking radial forces Hydrostatically Balanced.

Ordering Code (mounting hardware to be ordered separately)

A6V 55 HD X F Z 2 132

PUMP SIZE in^3/rev
28 = 1.7
55 = 3.3
80 = 4.8
107 = 6.5
160 = 9.7
225 = 13.7

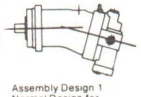
CONTROL DEVICE
HD = Remote hydraulic pilot control
HA = Automatic control (High pressure related)
DA = Hydraulic control
EL = Proportional Electric control
MO = Mooring control
MA = Handwheel control

DESIGN SERIES

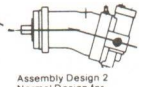
LINE CONNECTION, Flange SAE

SHAFT END
P = Keyed
Z = Splined

ASSEMBLY DESIGN
1 = Design No. 1
2 = Design No. 2



Assembly Design 1
Normal Design for
Controls Ha, Mo

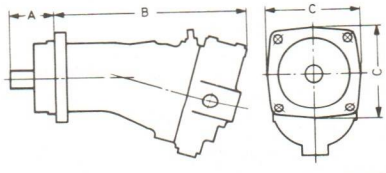


Assembly Design 2
Normal Design for
Controls Hd, El, Da

SWIVEL ANGLE
132 = 13.2°
85 = 8.5°
(Variable from 7° to 14°, specify)

Technical Data

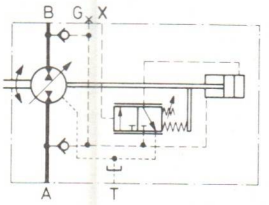
Size	Size	28	55	80	107	160	225
Displacement	in^3/rev	1.71	3.34	4.88	6.52	9.76	13.73
Displacement	in^3/rev	0.49	0.96	1.40	1.87	2.80	3.95
Max. permissible consumption $Q_{max.}$	gpm	35	54	70.8	84.7	112	140
Max. speed (while maintaining max. consumption rate) $n_{max.}$	rpm	6250	5000	4500	4000	3500	3100
Weight (approx.)	lbs	40	60	86	115	163	227
Dimension A (approx.)	inches	2.5	2.5	3.0	3.0	3.5	4.0
	mm	68	67	72	85	90	105
Dimension B (approx.)	inches	10	12	14.5	15	17	18.5
	mm	249	312	368	378	440	468
Dimension C (approx.)	inches	4.5	6.0	6.5	7.5	8.0	9.0
	mm	118	150	165	190	210	236



For detailed information
please see individual leaflet A6V

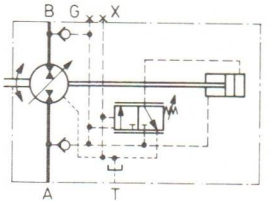
Size 28 to 500

HD
Remote hydraulic pilot control
Adjustment of displacement in relation to a pilot pressure signal. Continuous control or two position control

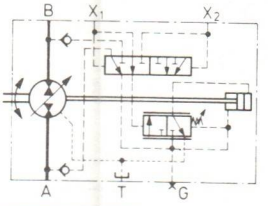


A, B service lines
T leakage fluid
X, X_1, X_2 pilot pressure
G remote control pressure

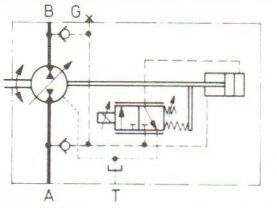
HA
Automatic control, high pressure related
Adjustment of displacement in relation to operating pressure. On reaching the operating pressure set with the control, adjustment vom V_{min} to V_{max} (max. torque).



DA
Hydraulic control, speed related
Adjustment of displacement in relation to pilot pressure (speed related) and to high pressure.

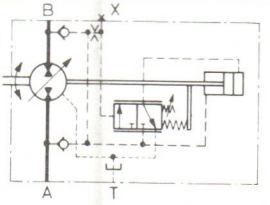


EL
Proportional electric control
Adjustment of displacement in relation to an electrical signal via a control solenoid.
Continuous control or two position control

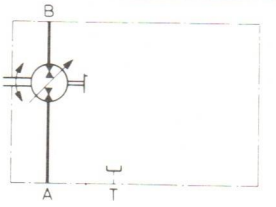


Not available above size 225

MO
Mooring control
Adjustment of displacement in relation to pilot pressure while maintaining a constant, but variable according to requirement, torque. Specially for the drive of mooring winches to produce a constant tension on the rope



MA
Handwheel control
Adjustment of displacement in relation to the position of the threaded spindle, operation by means of handwheel



Ordering Code (mounting hardware to be ordered separately)

Size 250 to 500

A6V 355 HD X F Z 2 132

PUMP SIZE in^3/rev
250 = 15.2
355 = 21.6
500 = 30.4

CONTROL DEVICE
HD = Remote hydraulic pilot control
HA = Automatic control (High pressure related)
DA = Hydraulic control (Speed related - RPM)
EL = Proportional electric control
MO = Mooring control
MA = Handwheel control

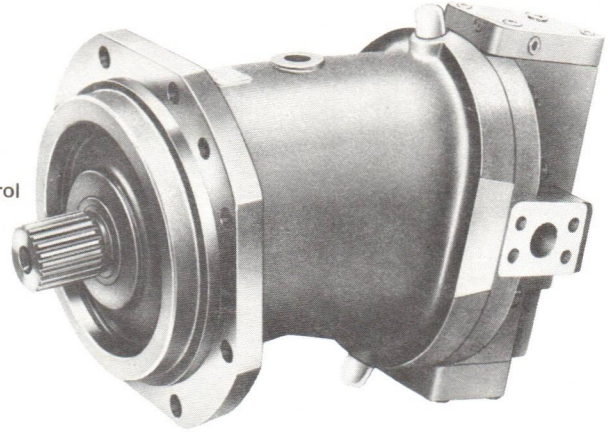
DESIGN SERIES

LINE CONNECTION, Flange SAE

SHAFT END
P = Keyed
Z = Splined

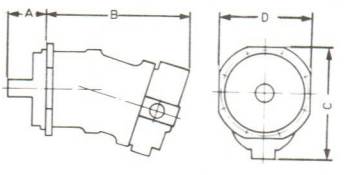
ASSEMBLY DESIGN
1 = Design No. 1
2 = Design No. 2

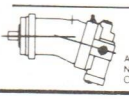
SWIVEL ANGLE
132 = 13.2°
85 = 8.5°
(Variable from 7° to 14°, specify)



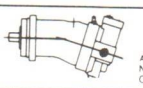
Size	Size	355	500
Displacement	in^3/rev	21.7	30.5
Displacement	in^3/rev	5.9	8.2
Max. permissible consumption $Q_{max.}$	gpm	210	264
Max. speed (while maintaining max. consumption rate) $n_{max.}$	rpm	2800	2500
Weight (approx.)	lbs		
Dimension A (approx.)	inches	5.0	5.0
	mm	132	132
Dimension B (approx.)	inches	21	22.5
	mm	530	572
Dimension C (approx.)	inches	17	19
	mm	440	475
Dimension D (approx.)	inches	13	15
	mm	335	375

Technical Data





Assembly Design 1
Normal Design for Controls Ha, Mo



Assembly Design 2
Normal Design for Controls Hd, El, Da

A7V Axial Piston Pump

The A7V axial piston variable displacement pump was especially designed for open circuit operation in construction and industrial machinery areas where a single source is to provide power to more than one consumer.

The principle of operation is basically the same as all bent axis piston pumps. That is, by turning the drive shaft the cylinder is put into motion via pistons and piston rods. Swivelling the cylinder about the axis of the the shaft causes the pistons to stroke. Increasing the swivel angle increases the stroke of the pistons and thereby varies the pump displacement.

The principle construction of the ultra reliable A2 bent axis rotary group with its robust bearings was incorporated into the A7V. However, an innovation in the distribution of fluid (a function of the control plate and port plate) was introduced. This innovation allowed the cumbersome and intricate casting of the swivel housing to be eliminated and also allowed the port plate, control device and end cover to be incorporated in one, thus allowing the use of fewer components.

It is the innovation in the distribution of the fluid that allows the new A7V pump to be a more compact and economical pump

Sizes 20–225

Size 20 to 225

Ordering Code (mounting hardware to be ordered separately)

A7V 55 LV X L Z

PUMP SIZE in^3/rev

20	=	1.2
28	=	1.7
40	=	2.4
55	=	3.3
58	=	3.5
78	=	4.7
80	=	4.8
107	=	6.5
117	=	7.1
160	=	9.7
164	=	10
225	=	13.7

CONTROL DEVICE

LV	=	Constant HP control
DR	=	Constant pressure control
HD	=	Remote hydraulic pilot control
EL	=	Proportional electric control
MA	=	Handwheel control*

DESIGN SERIES

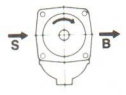
DIRECTION OF ROTATION

R	=	Clockwise
L	=	Counterclockwise

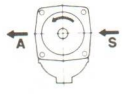
SHAFT END

P	=	Keyed
Z	=	Splined

*Available only in 20 to 164 sizes



Clockwise



Counter Clockwise

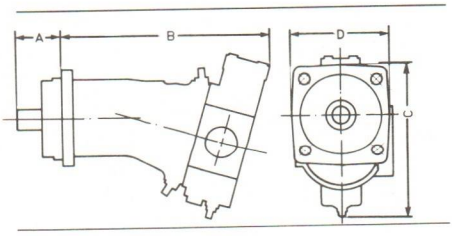
CALCULATION OF SIZE

Flow	$Q = \frac{Vg \times n \times \eta_v \times \sin\alpha}{231 \times \sin 25^\circ}$	[gpm]
Torque	$M = \frac{Vg \times \Delta p \times \sin\alpha}{24 \times \pi \times \eta_{mh} \times \sin 25^\circ}$	[lbs.-ft.]
Power	$P = \frac{M \times n}{5252} = \frac{Q \times \Delta p}{1715 \times \eta_t}$	[HP]

V_g = Max. geometric displacement (in³/rev.)
M = Torque (lbs. ft.)
Δp = Differential pressure (psi)
n = Speed (rpm)
η_v = volumetric efficiency
η_{mh} = mechanical-hydraulic efficiency
η_t = overall efficiency
α = swivel angel (°)
P = Drive Power (HP)
Q = Flow (gpm)

Technical Data

Size	Size	20	28	40	55	58	78	80	107	117	160	164	225
Displacement max.	in^3/rev	1.25	1.71	2.45	3.34	3.57	4.76	4.88	6.53	7.14	9.76	10.04	13.72
Displacement min.	in^3/rev	0	.49	0	.96	0	0	1.40	1.88	0	2.81	0	3.95
Max. speed 1) at 14.5 psia $n_{max.\ 14.5}$	rpm	4100	3000	3400	2500	3000	2700	2240	2000	2300	1750	2000	1500
Max. speed 1) at 21.7 psia $n_{max.\ 21.7}$	rpm	4750	3600	3750	3000	3350	3000	2750	2450	2650	2100	2360	1800
Max. flow 2) at $n_{max.\ 14.5}$ $Q_{max.14.5}$	gpm	21.5	21.5	34.9	35.0	44.9	53.9	45.9	54.8	68.9	71.7	84.3	86.4
Max. flow 2) at $n_{max.\ 21.7}$ $Q_{max.\ 21.7}$	gpm	24.8	25	38.6	47.6	50.2	60.0	56.3	67.1	79.3	86.2	99.4	103.9
Weight (approx.)	lbs	42	42	62	62	97	117	97	117	168	168	231	231
Dimension A (approx.)	inches	2.5	2.5	2.5	2.5	3.0	3.5	3.0	3.5	3.5	3.5	4.0	4.0
	mm	68	68	66	66	72	85	72	85	90	90	105	105
Dimension B (approx.)	inches	10	10	12.5	13	14.5	15	15	15.5	17.5	18	18.5	19
	mm	250	259	317	332	374	381	384	393	443	454	468	482
Dimension C (approx.)	inches	9.0	9.0	10	10	10.5	11.5	11	11	12.5	12.5	14	14
	mm	222	221	258	255	265	290	272	288	320	322	352	348
Dimension D (approx.)	inches	4.5	4.5	6.0	6.0	6.5	7.5	6.5	7.5	8.0	8.0	9.0	9.0
	mm	118	118	150	150	165	190	165	190	210	210	236	236



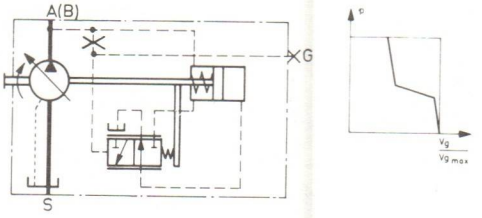
1) These values are valid provided there is an absolute pressure of 14.5 psia (0-psi gauge pressure) or 21.7 psia (7.2 psi gauge pressure) at suction inlet S and when operated on mineral oils.

2) 3% displacement losses included (Vg max. 0.97)

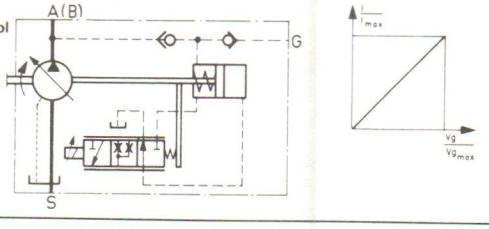
Size 20 to 1000

A, B service lines
R venting
X, X_1, X_2 pilot pressure
G remote control pressure
S suction line
T leakage fluid

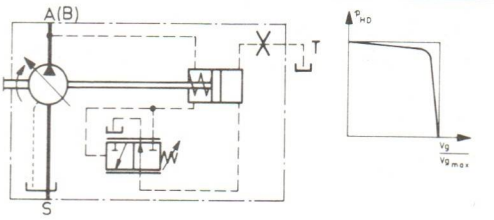
LV
Constant HP control
Adjustment of displacement in relation to operating pressure while maintaining constant horsepower at constant drive speed (increasing pressure, reducing flow)



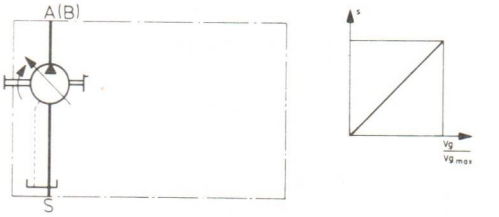
EL
Proportional electric control
Adjustment of displacement in relation to an electrical signal



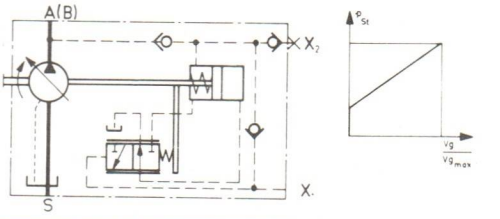
DR
Constant pressure control
Adjustment of displacement in relation to oil volume while maintaining a constant operating pressure



MA
Handwheel control
Adjustment of displacement in position of the threaded spindle, operation by means of handwheel



HD
Remote hydraulic pilot control
Adjustment of displacement in relation to a pilot pressure signal



Size 250 to 1000

A7V 355 DR X R Z

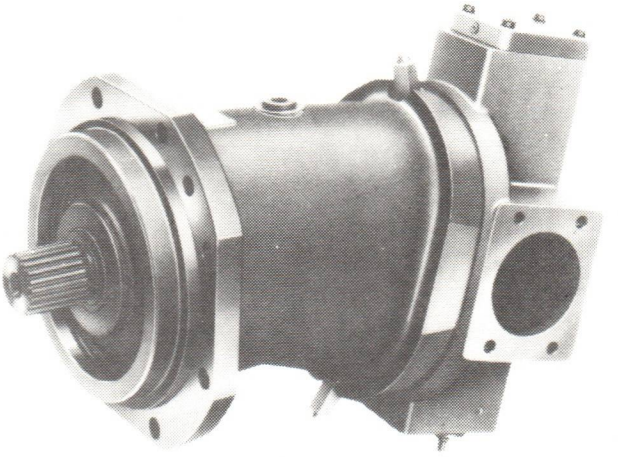
PUMP SIZE in^3/rev
250 = 15.2
355 = 21.6
500 = 30.5
1000 = 61.0

CONTROL DEVICE
LV = Constant hp control
DR = Constant Pressure control
HD = Remote hydraulic pilot control
EL = Proportional electric control

DESIGN SERIES

DIRECTION OF ROTATION
R = Clockwise
L = Counterclockwise

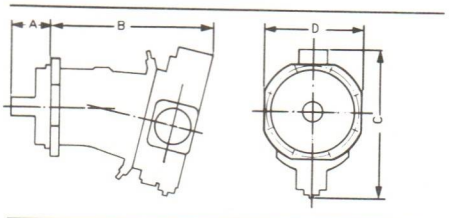
SHAFT END
P = Keyed
Z = Splined



Sizes 355–1000

Technical Data

Size	Size	250	355	500	1000
Displacement max.	in^3/rev	15.2	21.7	30.5	61
Max. speed[1] at 14.5 psia $n_{max.\ 14.5}$	rpm	1450	1320	1200	950
Max. speed[1] at 21.7 psia $n_{max.\ 21.7}$	rpm	1800	1650	1500	1180
Max. flow[2] at $n_{14.5}$ $Q_{14.5}$	gpm	87	120	153	243
Max. flow[2] at $n_{21.7}$ $Q_{21.7}$	gpm	62	150	192	302
Weight (approx.)	lbs			540	
Dimension A (approx.)	inches	4.0	5.0	5.0	7.0
	mm	108	132	132	180
Dimension B (approx.)	inches	19.5	22	24	32
	mm	498	555	615	812
Dimension C (approx.)	inches	19.5	20	22	31
	mm	500	515	563	780
Dimension D (approx.)	inches	10	13	15	18
	mm	252	335	375	465



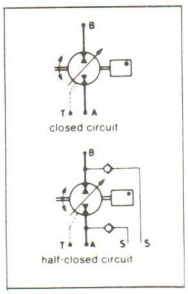
1) Provided there is an absolute press. of 14.5 psia (0-psi gauge pressure) or 21.7 psia (7.2 psi gauge pressure) at suction inlet S and when operated on mineral oils.
2) 3% displacement losses included (Vg max. 0.97)

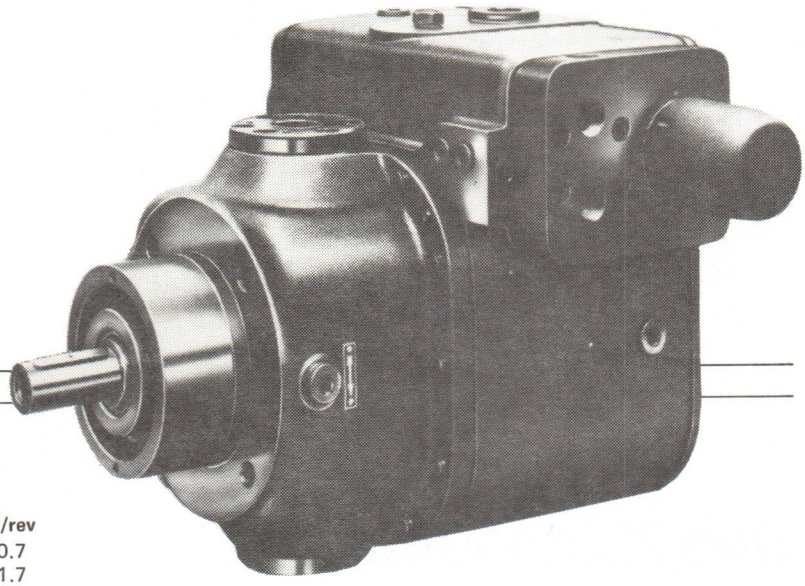
A2V AxialPistonPump

At constant speed, the flow of the pump is infinitely variable by changing the swivel angle. Swivelling the pump over center or changing the direction of rotation, smoothly reverses the direction of flow.

The variable displacement pump without control and regulating devices is the basic unit which is normally supplemented by mounting the control device.

With the sizes 12 to 107 the control device is flanged onto the basic unit.





Size 12 to 107

Ordering Code

A2V 55 Ma G R 1 G P

PUMP SIZE in^3/rev
- 12 = 0.7
- 28 = 1.7
- 55 = 3.3
- 107 = 6.5

CONTROL DEVICE
- MA = Handwheel adjustment
- EL = Proportional electric control
- HM = Hydraulic adjustment (flow related)
- HD = Hydraulic adjustment (pressure related)

TYPE OF CIRCUIT
- G = Closed circuit
- H = Half-closed circuit

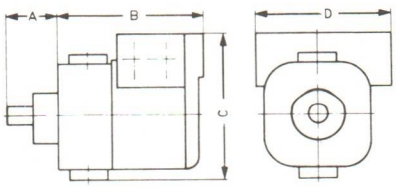
DIRECTION OF ROTATION
- R = Clockwise
- L = Counterclockwise
- W = Bidirectional

DESIGN SERIES

SHAFT END, Keyed

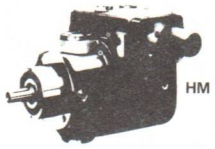
Technical Data

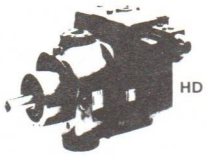
Size	Size	12	28	55	107
Displacement V_g max.	in^3/rev	0.708	1.71	3.34	6.52
Max. speed in closed circuit n_c max.	rpm	6000	4750	3750	3000
Max. speed in semi-closed circuit n_{sc} max.	rpm			2200	1750
Flow at speed n_c max.	gpm	18.3	35.2	54.2	84.7
Flow at speed n_{sc} max.	gpm			31.7	49.4
Weight with control device (approx.)	lbs	50	80	145	248
Dimension A (approx.)	inches	3.0	4.0	5.0	6.0
	mm	80	100	123	160
Dimension B with control device max. (app.)	inches	9.5	11	13.5	16
	mm	244	279	343	414
Dimension C with control device max. (app.)	inches	12	14.5	17	18
	mm	312	347	427	501
Dimension D with control device max. (app.)	inches	14.5	15	17	18.5
	mm	371	387	429	474



Size 12 to 1000

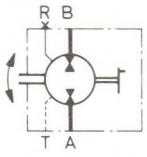
A, B	service lines
S	suction lines
R	venting
T	leakage fluid
T_1	tank port for power input
P	pilot oil inlet
P_1	boost connection
G	pilot oil return
X_1, X_2	pilot ports (for hydraulic remote control)
X_3, X_4	pilot ports (for power input)

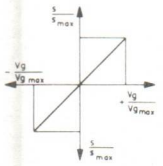




MA
Handwheel control
Adjustment of displacement in relation to position of threaded spindle, operation by means of handwheel

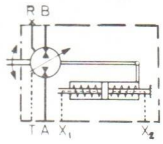
Available on all sizes

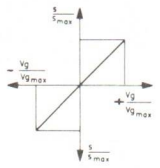




HM
Hydraulic control, flow related
Adjustment of displacement in relation to pilot oil volume

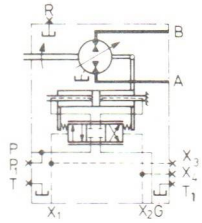
Sizes 55 and 107
Option with servo valve control

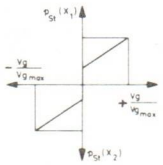




HD
Remote hydraulic pilot control
Adjustment of displacement in relation to an hydraulic, electric or pneumatic input signal. Additional function: constant HP control

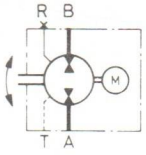
Size 55 and 107

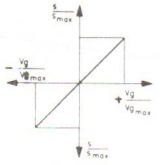




EL
Electric control
Adjustment of displacement in relation to position of threaded spindle, operation by electric motor

Available on all sizes





Size 250 to 1000

A2V 250 MA G R 5 G P

PUMP SIZE
250 = 15.2
355 = 21.6
500 = 30.4
1000 = 60.9

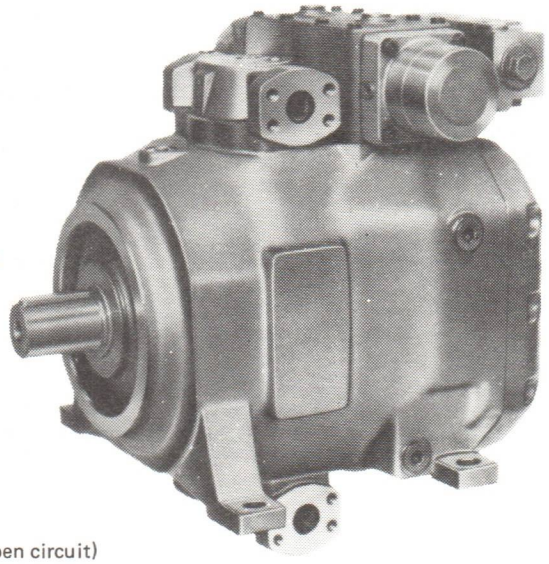
CONTROL DEVICE
MA = Handwheel adjustment
EL = Electric control
HD = Remote hydraulic pilot control
HS = Hydraulic control (flow related w/servo)

TYPE OF CIRCUIT
g = Closed circuit
h = Half-closed circuit

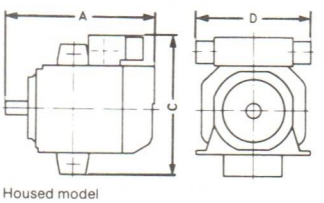
DIRECTION OF ROTATION
R = Clockwise
L = Counterclockwise
W = Bidirectional (Not for open circuit)

DESIGN SERIES

SHAFT END
P = Keyed
Z = Splined



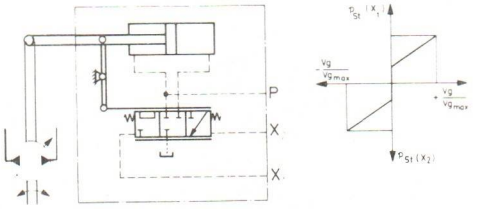
Size	Size	250	355	500	1000
Displacement $V_{g\ max.}$	in^3/rev	15.3	21.7	30.5	61
Max. speed in closed circuit $n_{c\ max.}$	rpm	2500	2240	2000	1600
Max. speed in semi-closed circuit $n_{sc\ max.}$	rpm	1320	1200	1060	850
Flow at speed $n_{c\ max.}$	gpm	165	210	264	422
Flow at speed $n_{sc\ max.}$	gpm	87	62	140	224
Weight (approx.)	lbs			925	
Dimension A (approx.)	inches	22	25	27	33.5
	mm	559	645	685	848
Dimension B (approx.)	inches	22.5	23	26	31
	mm	576	580	661	792
Dimension C (approx.)	inches	22.5	24	26.5	32
	mm	569	608	673	818
Dimension D (approx.)	inches	19	19	21.5	22
	mm	485	485	550	565

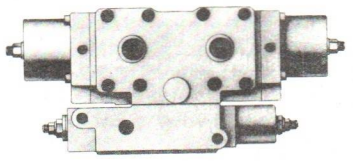


Housed model

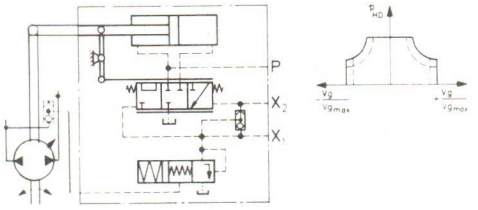
Size 250 to 1000

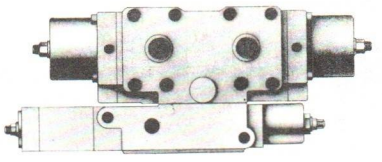
HD
Remote hydraulic pilot control
Adjustment of displacement in relation to a pilot pressure signal



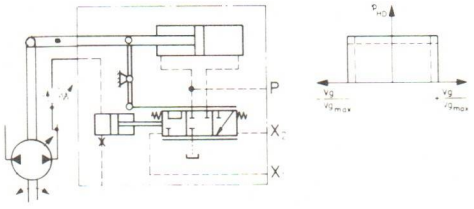


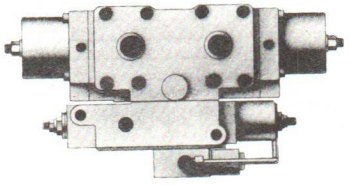
HD
Remote hydraulic pilot control
Additional function: constant HP control
Adjustment of displacement in relation to a pilot pressure signal and varied by means of a superimposed high pressure signal



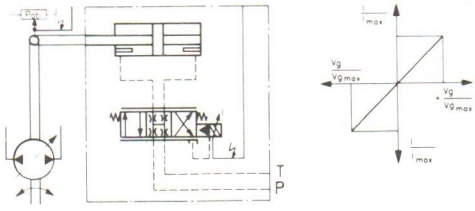


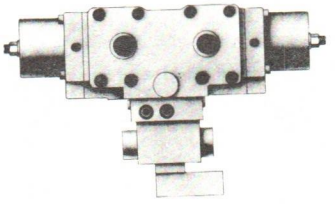
HD
Remote hydraulic pilot control
Additional function: constant pressure control
Adjustment of displacement in relation to a pilot pressure signal and varied by means of a superimposed high pressure related signal

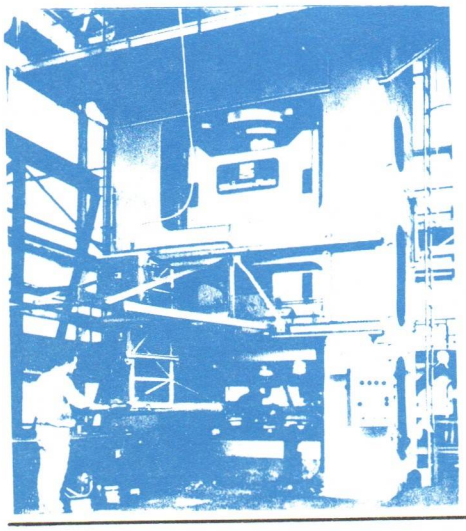


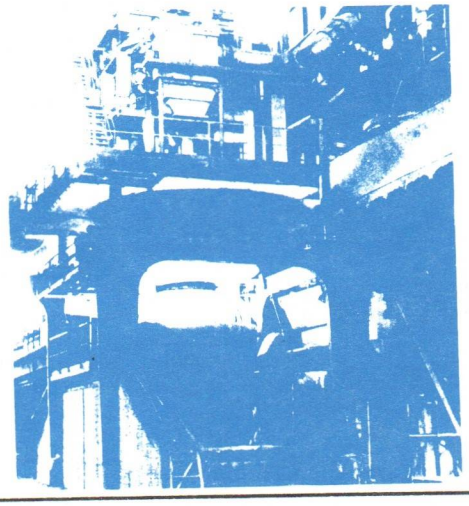


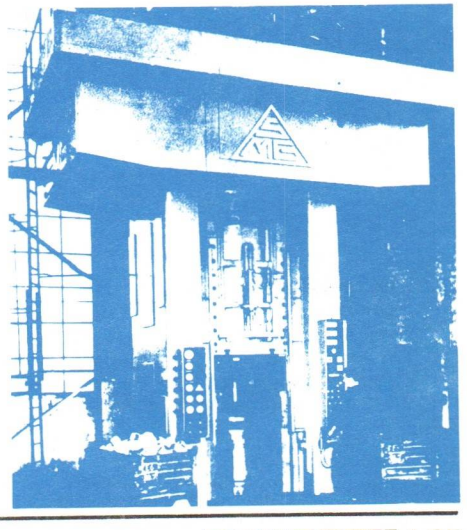
HS
Hydraulic control, flow related, with servo valve
Adjustment of displacement in relation to pilot oil volume, with built-on servo valve











AA4V Axial Piston Pump

GENERAL DESCRIPTION . . . the A4V is a swashplate design, variable displacement, over center, axial piston pump manufactured by the Hydromatik Division of Rexroth.

The A4V has been designed exclusively for closed circuit hydrostatic transmissions where a self contained pump package is required. The pump design incorporates a charge pump, a charge pressure relief valve, and two combination high pressure relief and make up check valves.

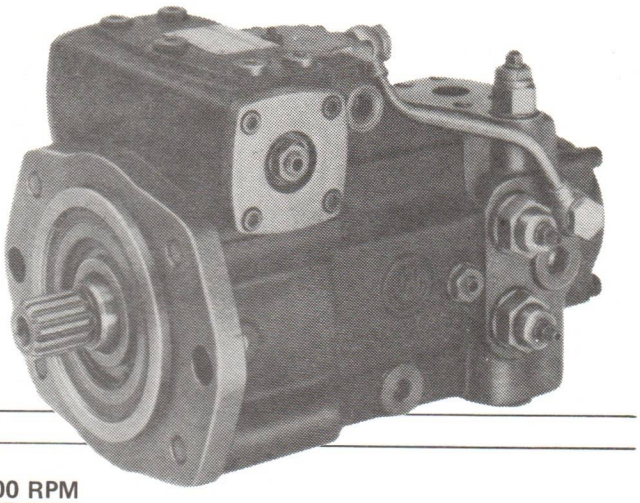
The control options are of modular design to allow interchangeability without altering the basic pump. The three primary controls are:

remote hydraulic pilot	(type HD)
manual rotary servo	(type HW)
proportional electric	(type EL)

A range of control accessories is available to extend the control versatility of this pump.

MORE DETAILED INFORMATION ON MOUNTING POSITION, INSTALLATION, FILTRATION, FLUIDS AND START-UP PROCEDURES, IS AVAILABLE IN A SEPARATE PUBLICATION TITLED 'REXROTH HYDROSTATIC TRANSMISSION APPLICATION MANUAL'.

SAE Version AA



Size 40 to 125

Refer to RA 13340 (ISO)
Refer to RA 13341 (SAE)

Ordering Code

AA4V 56 HD 1 L 3 D 2 A 2 /*Diesel Engine, 50 HP at 2500 RPM

SAE VERSION

PUMP SIZE in³/rev
- 40 = 2.44 SAE "C" flange
- 56 = 3.42 SAE "C" flange
- 90 = 5.49 SAE "C & D" flange
- 125 = 7.63 SAE "D" flange

CONTROLS
- HD = Remote hydraulic pilot
- HW = Manual rotary servo
- EL = Proportional electric (24 VDC std.)
- OV = Without control
- MS = Torque (swing) control*

DESIGN SERIES

DIRECTION OF ROTATION
- R = Clockwise
- L = Counterclockwise

MOUNTING CONFIGURATION
- 3 = SAE "C" 2-bolt, size 40 & 56
- 3 = SAE "D" 2-bolt, size 90 & 125

THROUGH DRIVE FOR AUXILIARY PUMP
- O = Without drive
- D = W/through drive**

PRESSURE OVERRIDE & FILTER PORT
- 1 = W/porting for suction filter only, std.
- 2 = W/porting for ext. charge flow filter
- 3 = W/porting for suction & fitted w/press. override
- 4 = W/porting for ext. charge flow filter and pressure override

SPEED SENSING HP LIMITER*
- O = Without control cartridge
- A = Control cartridge with fixed adjustment
- B = Control cartridge w/mech. adjustment

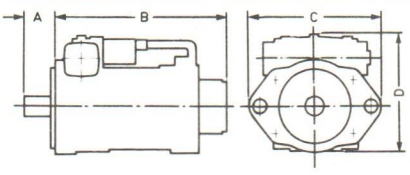
HIGH PRESSURE RELIEF VALVES
- 1 = W/pilot operated relief valve, adjustment (3625 to 6000 psi)
- 2 = W/pilot relief adjustment (1160 to 4640 psi)
- 3 = W/direct operated relief adjustment (3625 to 6000 psi) (for winch applications)
- 4 = Without high pressure relief (must be used with ext. press. protection)

ADDITIONAL INFORMATION
For EI control, specify if 12VDC is required.
For speed sensing, hp limiter, specify drive speed and hp.

* With torque control valve, part no. 832581, mounted and piped to pump. Refer to RA 13343.
** Refer to RA 13344
*** For use with diesel or gasoline engines only. Pump drive power and speed must be specified at the end of the ordering code. Refer to RA 13345.

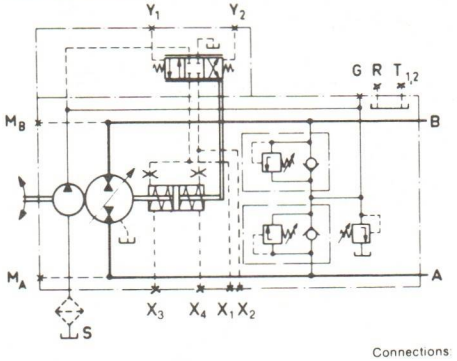
Technical Data

Size	Size	40	56	90	125
Displacement V_g max.	in^3/rev	2.44	3.42	5.49	7.63
Maximum speed in closed circuit n_c max.	rpm	3700	3400	2900	2600
Flow at n_c max.	gpm	39	50	69	85.9
Weight (approx.)	lbs	65	77	112	165
Dimension A (approx.)	inches	2.185	2.185	2.185	2.435
	mm	56	56	56	62
Dimension B (approx.)	inches	11	11.5	13	15
	mm	275	296	330	376
Dimension C (approx.)	inches	8.40	8..40	10.50	10.50
	mm	213	213	267	267
Dimension D (approx.)	inches	7.5	8.0	9.5	10
	mm	190	210	240	260



REFER TO RA 13341
FOR COMPLETE ENGINEERING DATA

Control Device Schematics



Connections:

A, B —— Service Lines
G —— Pressure Port for Charge Circuit
T_1 —— Leakage Oil/Filler
T_2 —— Leakage Oil/Drain
M_A —— Gage Connection, Service Line A
M_B —— Gage Connection, Service Line B
R —— Vent and Case Pressure Gage Port
S —— Suction Line for Charge Oil
X_1, X_2 —— Control Pressure Gage Connections (before control orifices)
X_3, X_4 —— Control Pressure Gage Connections (after control orifices)
Y_1, Y_2 —— Remote Pilot Pressure Connection (e.g. "Joy Stick")

ORDERING CODE 'HD'
Remote Hydraulic Pilot Control

The flow output of the pump is infinitely varied in the range of 0 to 100%, proportional to a low pressure pilot signal, in the range of 85 to 260 PSI, applied at port Y_1 or Y_2.

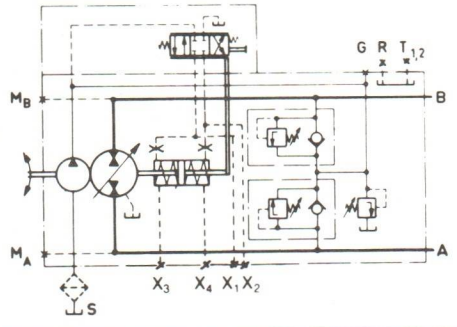
The pilot signal, which originates from an external, remote source, is pressure only. Flow is negligible as the pilot signal is only acting on the spool of the control valve.

This spool then directs control oil, in and out of the control cylinder to stroke the pump as required.

A feedback lever, connected to the control piston, maintains the pump flow for any given pilot signal.

With no command signal at Y_1 or Y_2, the control is in the neutral (0 flow) position preventing transmission output.

The REXROTH TH7 remote control, lever and foot pedal operated pilot valves, may be used directly with this pump control.



ORDERING CODE "HW"
Manual Rotary Servo Control

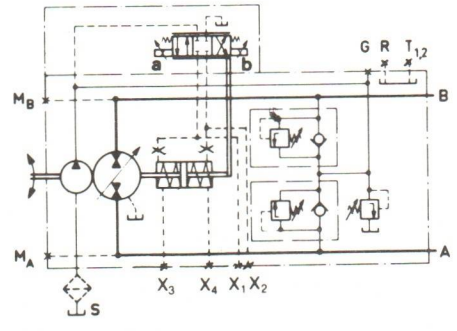
The flow output of the pump is infinitely varied in the range of 0 to 100%, proportional to the displacement of the control lever between 0° and 31°.

Flow from the pump is reversed by moving the lever from position 'a' to position 'b'.

A feedback lever, connected to the control piston, maintains the pump flow for any given position of the control lever between 0° and 31°.

The 'HW' control is suitable for use with push-pull cables and mechanical linkages.

The torque required to activate the control is 1.95 in lbs (22 Ncm).



ORDERING CODE 'EL'
Proportional Electrical Control

The flow output of the pump is infinitely varied in the range of 0 to 100%, proportional to an electrical current, in the range of 200 to 680 mA, supplied to solenoid a or b.

The electrical energy is converted to a force acting on the control spool. The spool then directs control oil in and out of the control cylinder to stroke the pump as required.

A feedback lever, connected to the control piston, maintains the pump flow for any given current.

Being a proportional control, the filtration requirement is no less than that of the total pump assembly.

A Rexroth amplifier, type VT-2000.K.20, is required to provide the control current to solenoid a or b. The amplifier requires an external voltage of 24 Vdc at 1 ampere maximum. A panel, or joystick mounted, 5000 ohm potentiometer is needed to control the amplifier output current to solenoid a or b.

ORDERING CODE 'OV'

This option is ordered when the A4V is to be used as a slave pump. A blanking plate is fitted to the control valve mounting surface. Control oil is delivered from external source directly to ports X_1 or X_2.

Example of OV application. Two A4V pumps on excavator swing drive being controlled by one remote, subplate mounted, swing control valve.

ORDERING CODE 'MS'

The MS control maintains system pressure output of an A4V pump, proportional to a low pressure pilot signal originating from a remote source, such as a joystick, lever, or foot pedal operated pilot valve, or panel mounted relief valve.

Simplified, the control allows the A4V to be utilized as a remotely adjusted, overcenter, pressure compensated pump.

Refer to engineering data sheet RA 13343 for details.

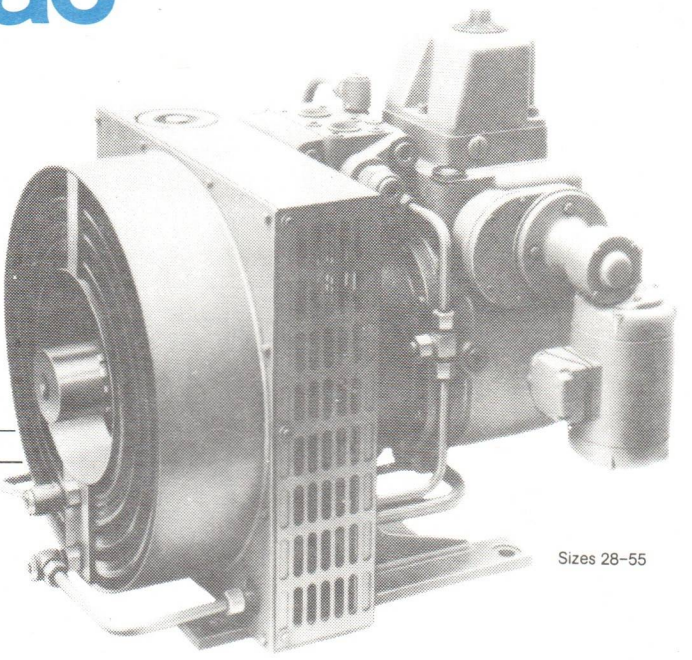
F1V PowerPac

for closed circuit

The REXROTH MODEL "F1V" hydraulic pump unit is a complete pump package used to drive a hydraulic motor. Incorporating a Model A2V variable displacement pump, (utilizing the same four pump controls listed under the A2V pump) . . . charge pump . . . combined oil cooler, filter and reservoir . . . charge system relief valve, along with the motor high pressure protection relief system, for motor operation in a closed circuit.

The only additional equipment required for this unique transmission, is the drive (electric) motor . . . hydraulic motor . . . and piping between the pump system, and the hydraulic motor . . . hydraulic system fluid . . . and the control connection.

(This unit is used with the A2F fixed motor or the A6V variable motor.)



Sizes 28–55

Size 28 to 55

Ordering Code

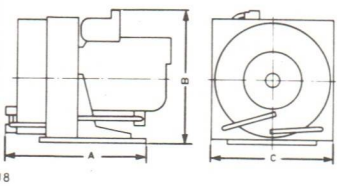
F1V 55 EL G R 1

- **PUMP SIZE in³/rev**
  - 28 = 1.71
  - 55 = 3.34
- **CONTROL DEVICE**
  - MA = Handwheel control
  - EL = Proportional electric control
  - HD = Remote hydraulic pilot control*
- **TYPE OF CIRCUIT, Closed**
- **DIRECTION OF ROTATION, Clockwise**
- **SERIES**

*Size 55 only

Technical Data

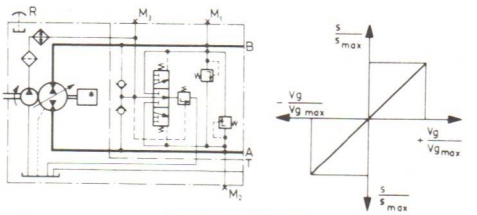
Size		Size	28	55
Displacement	variable pump	in³/rev	1.71	3.34
	boost pump	in³/rev	0.226	0.824
Maximum speed $n_{max.}$		rpm	3150	2500
Minimum speed $n_{min.}$		rpm	700	800
Flow at speed $n_{max.}$ $Q_{max.}$		gpm	23.3	36.1
Weight (approx.)		lbs	220	353
Dimension A (approx.)		inches	21	23.5
		mm	540	600
Dimension B (approx.)		inches	16	19
		mm	400	480
Dimension C (approx.)		inches	14	17
		mm	350	430



18

For detailed information please see individual leaflet F1V, control device leaflets MA, GE, EL, HW

Control Device Schematics



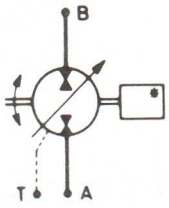
A, B	service lines	G	pressure fluid for boost circuit
R	oil fill and venting	He	cooler inlet
T	leakage fluid		
M_1, M_2, M_3	gauge connections		

EW PowerPac

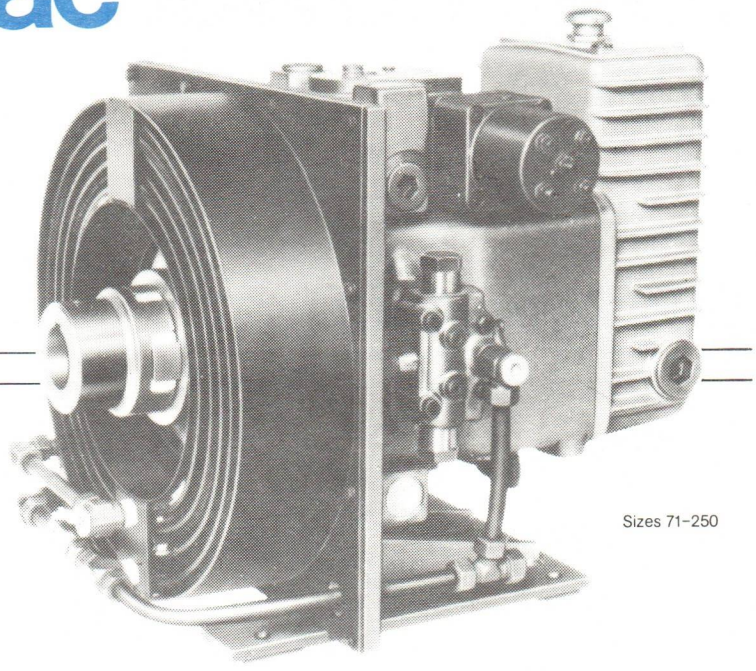
for closed circuit

Power pack, constructed on the modular principle, consisting of variable pump with charge pump, flushing and pressure relief valves, pressure filter in charge circuit. Optionally with the addition of control device, oil/air cooler, coupling, housing cover or header tank, angle or foot mounting.

For detailed information please see individual leaflet EW, control device leaflets R, S, V.



closed circuit



Sizes 71–250

Size 71 to 250

Ordering Code

125 E W 2 R P 1 V3031

PUMP SIZE in^3/rev
- 71 = 4.3
- 125 = 7.6
- 250 = 15.2

SERIES

DESIGN

TYPE OF CIRCUIT, Closed

DIRECTION OF ROTATION
- R = Clockwise
- L = Counterclockwise

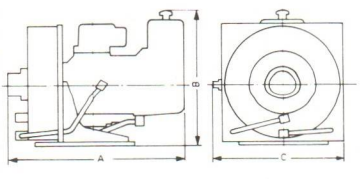
SHAFT END
- P = Keyed
- Z = Splined

PIPE CONNECTION, SAE Flange

CONTROL DEVICE
- V1100 = Handwheel control
- V3110 = Electric Control
- V3031 = Remote hydraulic pilot control
- V3141 = W/hp control
- V3441 = W/constant press. control
- V2120 = Hydraulic control w/servo

Technical Data

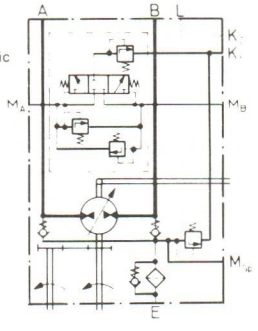
Size		Size	71	125	250
Displacement (variable pump) $_{max.}$		in^3/rev	4.3	7.6	15.2
Displacement	charge circuit	in^3/rev	0.59	0.79	1.34
(charge pump)	control supply circuit	in^3/rev	0.36	0.36	0.59
	aux. circuit	in^3/rev	0.16	0.16	0.16
Maximum speed $n_{max.}$		rpm	2600	2400	1800
Minimum speed $n_{min.}$ (contin. operation)		rpm	750	750	750
Flow at $n_{max.}$		gpm	48.6	79.3	450
Weight (basic unit) approx.		lbs	172	255	440
Dimension A (approx.)		inches	27	29.5	36.5
		mm	680	752	927
Dimension B (approx.)		inches	21	24	28.5
		mm	540	612	720
Dimension C (approx.)		inches	19	22.5	27
		mm	480	572	690



A, B	service lines
E	boost fluid inlet
K_1	flushing fluid outlet
K_2	flushing fluid return
L	leakage fluid
M_A, M_B	gauge connections, working pressure
M_{Sp}	gauge connection, boost pressure

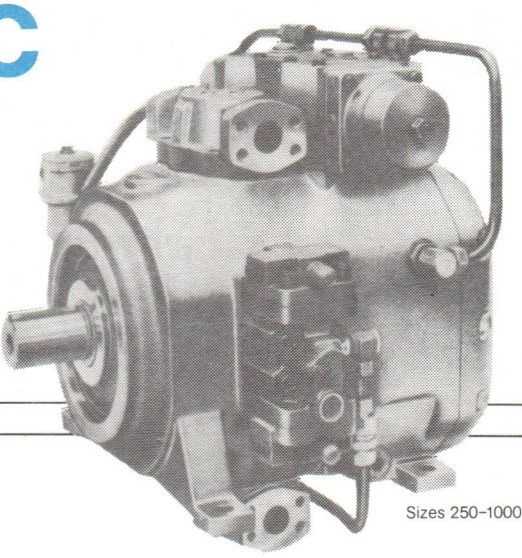
Control Device Schematic

Circuit (basic unit)



A2P PowerPac for closed circuit

A2P power pack, based on the variable A2V pump series 5, with auxiliary devices such as valve block and charge/control supply pumps mounted and piped.



Sizes 250–1000

Size 250 to 1000

Ordering Code

A2P 250 HD G R 5 G P

PUMP SIZE in^3/rev
- 250 = 15.2
- 355 = 21.6
- 500 = 30.4
- 1000 = 60.9

CONTROL DEVICE
- EL = Electric control
- HD = Remote hydraulic pilot control
- HS = Hydraulic control (flow related w/servo)

TYPE OF CIRCUIT, Closed

DIRECTION OF ROTATION
- R = Clockwise
- L = Counterclockwise

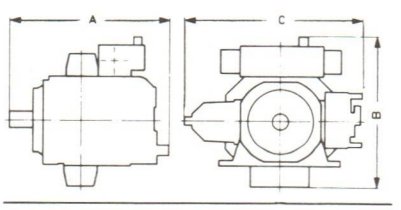
SERIES

DESIGN

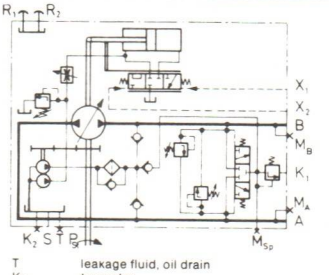
SHAFT END
- P = Keyed
- Z = Splined

Technical Data

Size		Size	250	500	1000
Displacement $V_{g\ max.}$		in^3/rev	15.3	30.5	61
Maximum speed $n_{max.}$		rpm	2500	2000	1600
Min. speed with built-on boost pump $n_{min.}$		rpm	500	500	500
Flow at $n_{max.}$		gpm	165	264	422
Displacement	charge circuit	in^3/rev	0.79	1.70	3.35
of boost pumps	control supply circuit	in^3/rev	0.35	0.79	1.34
Dimension A (approx.)		inches	24	29.5	
		mm	610	750	
Dimension B (approx.)		inches	23.5	28	
		mm	600	710	
Dimension C (approx.)		inches	28	32	
		mm	710	820	



A, B	service lines	X_1, X_2	pilot ports
S	suction line	R_1, R_2	oil fill and venting
P	pilot oil supply	M_A, M_B	gauge connections (service lines)
P_{St}	pilot pressure		

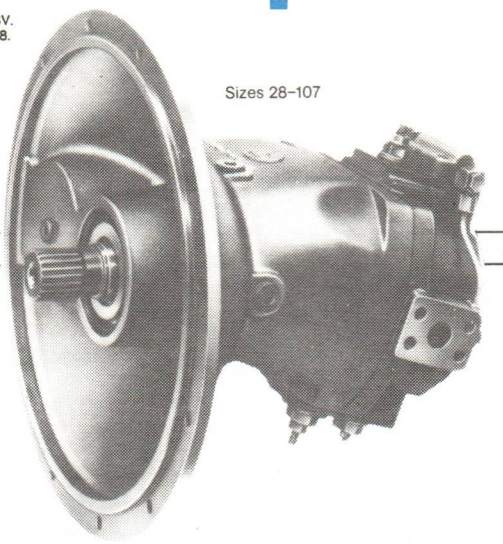


T	leakage fluid, oil drain
K_1	to cooler
K_2	from cooler
M_{Sp}	gauge connection, flushing pressure

A8V AxialPistonPump

Two variable displacement pumps, a distributor gear, the summation HP control, an SAE flange for direct mounting on the drive motor, these are the basic components of this double pump, available in various designs.

For detailed information please see individual leaflet A8V. Please request separate information leaflets for design 8.



Sizes 28–107

Size 28 to 107

Ordering Code

A8V 55 SR 1 R 1 0 1 F 1

PUMP SIZE in³/rev
28 = 1.71
55 = 3.34
80 = 4.88
107 = 6.52

CONTROL DEVICE
SR = Summation hp control

DESIGN, See Technical Data

DIRECTION OF ROTATION, Clockwise

SERIES

RATIO, See Technical Data

SUCTION CONNECTION
1 = Vertical
2 = Horizontal

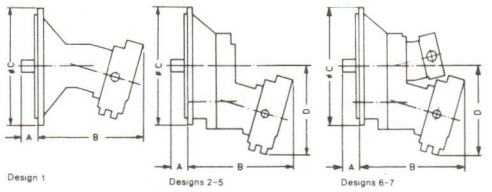
F = Flange, SAE *
G = Metric threaded**

STROKE LIMITATION
1 = Fixed
2 = Hydraulic

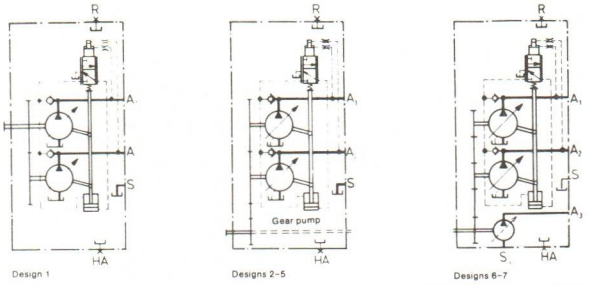
* Not available for size 28
** Size 28 only

Technical Data

Size		Size	28	55	80	107
Weight (approx.)	Design 1	lbs		143	198	275
Weight (approx.)	Designs 2 - 5	lbs	119	220	286	363
Weight (approx.)	Designs 6 - 8	lbs		264		419
Dimension A		inches	1.95	2.26	2.26	2.26
		mm	50	58	58	58
Dimension B		inches	10.9	14.0	16.3	17.2
		mm	281	361	418	443
Dimension C		inches	15.8	15.8	17.7	19.3
		mm	407	407	456	495
Dimension D		inches	10.3	12.1	13.4	14.0
		mm	265	312	344	360



A_1, A_2 service lines
S suction line
R venting
HA oil drain



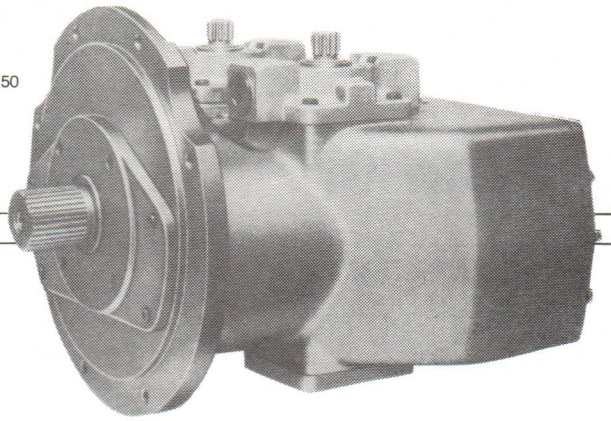
Design	Secondary Power Take-Off	Adaptation Gear	Size (Displacement Vg max. (in³) per rotary group) 1.71	3.37	4.90	6.56
1 Standard design	without secondary power take-off	i = constant (1:1)		●	●	●
2	without secondary power take-off	i = variable	●	●	●	●
3	mounting facility for fixed pump A2F	i = variable with	● with A2F12	● with A2F12	● with A2F28	● A2F28
4	Mounting facility for single or multiple gear pump, e.g. type SIGMA	i = variable	● with G2	● with G2	● with G2	● with G2
5	ready prepared for secondary power take-off (plugged))	i = variable	●	●	●	●
6	with integrated fixed pump A2F	i = variable		● with A2F28 A2F40 A2F55		● with A2F55
7	with integrated variable pump A7V	i = variable				● with A7V55
8	mounting facility for variable pump A4V or A7V. Additional secondary power take-off for single or multiple gear pump possible.	i = variable mechanical gearbox partitioned off from pump chamber	Variable displacement double pump design 8, optionally with 6.5, 6.3, 6.0, 5.8, 5.5 and 5.3 in³ displacement (per rotary group)			● with A4V56 A4V71 A7V55 A7V80 A2F 55 A2F 80

ET DoublePump

Variable Displacement Double Pump
for open, closed and semi-closed circuit

Two variable displacement pumps and a distributor gear form the variable displacement double pump. The two independent flows are influenced by means of built-on control devices. Additional power take-off possible.

Size 31–250



Size 31 to 250

Ordering Code

125 E T 2 R P 1 R

PUMP SIZE in^3/rev
31 = 1.9
71 = 4.3
125 = 7.6
250 = 15.2

SERIES

DESIGN

TYPE OF CIRCUIT
1 = Open circuit
2 = Closed circuit
3 = Semi-closed circuit

DIRECTION OF ROTATION
R = Clockwise
L = Counterclockwise

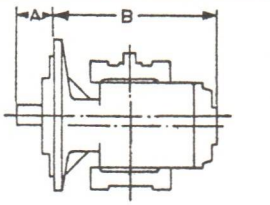
SHAFT END
P = Keyed
Z = Splined

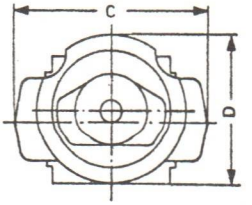
PIPE CONNECTION, SAE Flange

CONTROL DEVICE
R = Reg. control
S = Servo Control
V = Flow regulated servo control
Consult factory for details

Technical Data

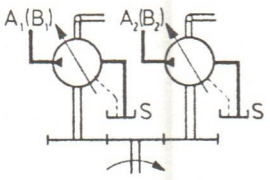
Size		Size	31	71	125	250
Displ. of individual rotary group $V_{g\ max.}$		in^3/rev	1.9	4.3	7.63	15.3
Max. drive speed n_d	open circuit	rpm	2175 - 3510	1512 - 3200	1336 - 2398	1064 - 2589
	closed circuit	rpm	3267 - 4127	2451 - 3565	2178 - 2904	1742 - 2801
	semi-closed circuit	rpm	1950 - 3146	1340 - 2837	1190 - 2138	954 - 2321
Transmission ratio $\frac{n_{driven}}{n_{pump}} = i$			0.7500 - 1.2105	0.6875 - 1.4545	0.7222 - 1.2963	0.7333 - 1.7857
Rot. group speed $\frac{n_d}{n_p} = i$	open circuit	rpm	2900	2200	1850	1500
	closed circuit	rpm	4356 - 3409	3565 - 2451	3015 - 2240	2376 - 1568
	semi-closed circuit	rpm	2600	1950	1650	1300
Flow at n_d	open circuit	gpm	2 x 23	2 x 40	2 x 59	2 x 96
	closed circuit	gpm	2 x 35 - 2 x 27	2 x 65 - 2 x 45	2 x 97 - 2 x 72	2 x 152 - 2 x 100
	semi-closed circuit	gpm	2 x 21	2 x 35	2 x 53	2 x 86
Weight (approx.)		lbs	207	432	672	846
Dimension A (approx.)		inches	4.0	4.3	4.4	4.6
		mm	105	112	115	120
Dimension B (approx.)		inches	13.6	17.16	20.4	25.0
		mm	350	440	525	643
Dimension C (approx.)		inches	15.1	18.7	23.9	30.8
		mm	388	480	615	790
Dimension D (approx.)		inches	11.7	16.6	18.1	17.7
		mm	300	428	465	592



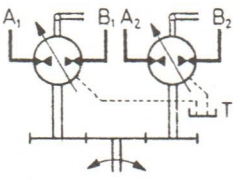


A_1, B_1, A_2, B_2 service lines
S suction line
T leakage fluid (tank)

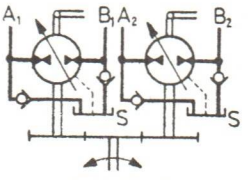
For detailed information please see individual leaflet ET, control device leaflet R, S, V



open circuit



closed circuit



semi-closed circuit

RotatingCaseMotors

The general principle of slow speed high torque rotating case motors is shown in the cut-away view on the right. Oil under pressure is fed through the shaft (which also acts as a distributor valve) to the cylinders between the opposed pistons. The pistons in turn bear against the multilobe cams to cause the cylinder block to rotate. The motor casing which is mounted on heavy duty bearings, is fixed to and rotates with the cylinder block.

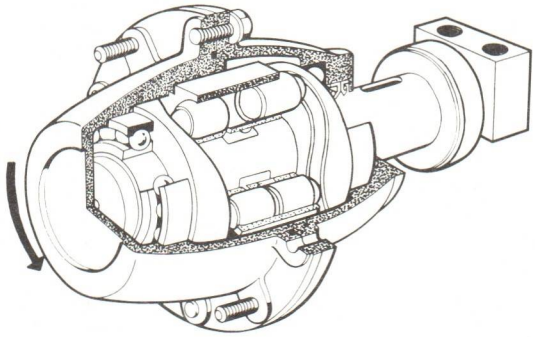
Already well established, these rotating case motors have been greatly improved by the use of new pistons porting arrangements, and heavy duty bearings.

CONTROL

1. All motors are fully reversible
2. Speeds down to 1 rev/min can be obtained with suitable circuitry.
3. All motors are capable of true free wheeling with no internal pumping action when installed in a suitable circuit.

OPTIONS

Alternate shafts
Alternate types of brakes
Alternate mounting arrangements



Type300

Ordering Code

CH 300 391 *

CASE TYPE
CH
CHB
CT
CA
K

MODEL
300

DISPLACEMENT (See technical data)
182
291
394
443

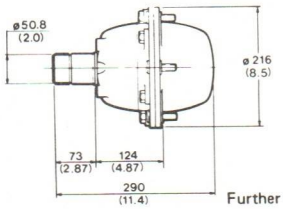
ADDITIONAL INFORMATION
For operation in transmission circuits at pressures above 250 bar peak = V10

Technical Data

Model	Displacement		Maximum Pressure		Theoretical Specific Torque		Max Speed	Max Radial Load	
	cm^3/rev	in^3/rev	bar	psi	Nm/100bar	lb.ft/1000psi	R.P.M.	kN	lb
300/182	182	11,1	280	4000	289	147	600	20	4495
300/291	291	17,7	280	4000	463	235	500	20	4495
300/394	394	24,0	280	4000	625	318	450	20	4495
300/443	443	27,0	280	4000	703	358	400	20	4495

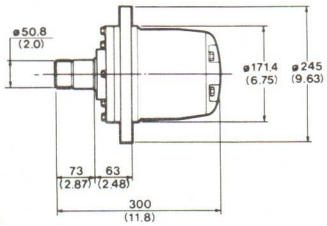
Dimensions are in mm (inches)

CH 300/*



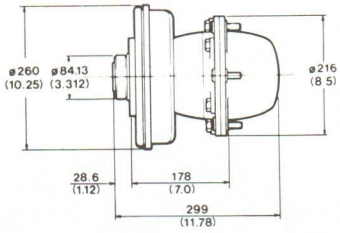
Weight 25Kg 55lb
Further details on RE 14 609

CT 300/*



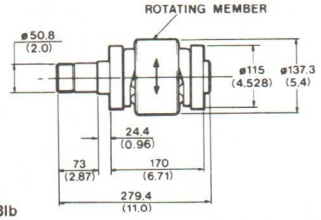
Weight 30Kg 66lb
Further details on RE 14 617

CHB 300/*



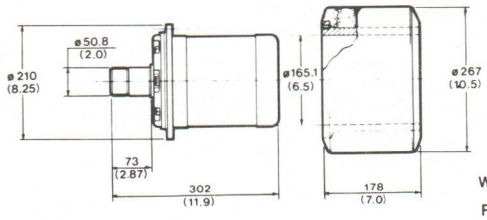
Weight 36Kg 80lb
Further details on RE 14 609

CA 300/*



Weight 15Kg 33lb
Further details on RE 14 660

K 300/*



Weight 47Kg 103lb (with tire)
Further details on RE 14 649

Ordering Code

Type800

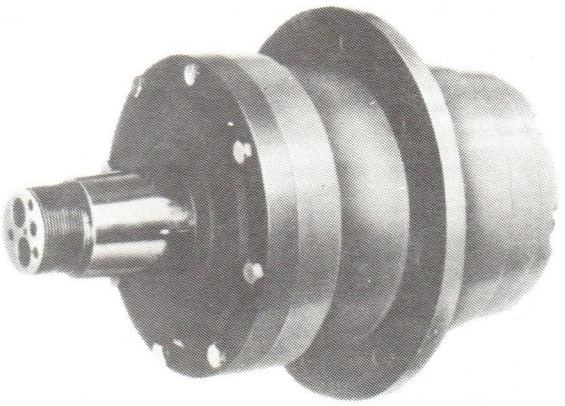
CH 800 / 765 *

CASE TYPE
- C
- CH
- CHB
- CA

MODEL
- 800

DISPLACEMENT (See technical data)
- 623
- 765
- 996

ADDITIONAL INFORMATION
For operation in transmission circuits at pressures above 250 bar peak = V10

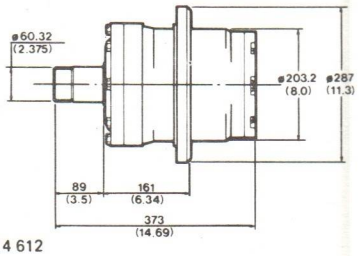


Technical Data

Model	Displacement		Maximum Pressure		Theoretical Specific Torque		Max Speed	Max Radial Load	
	cm^3/rev	in^3/rev	bar	psi	Nm / 100bar	lb.ft / 1000psi	R.P.M.	kN	lb
800/998	998	60.8	250	3620	1584	806	200	50	11250
800/765	765	46.6	250	3620	1216	619	300	50	11250
800/623	623	38.0	250	3620	990	504	350	50	11250

Dimensions are in mm (inches)

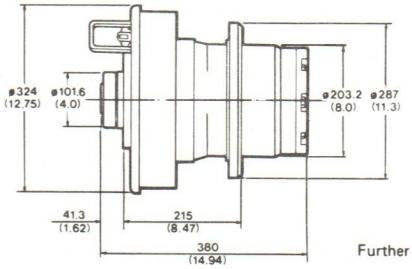
CH 800/*



Weight 64Kg 140lb

Further details on RE 14 612

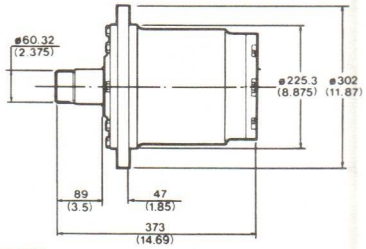
CHB 800/*



Weight 84Kg 185lb

Further details on RE 14 612

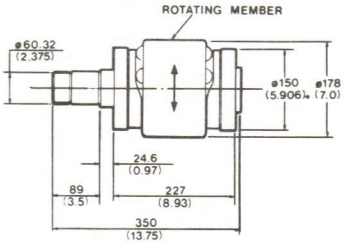
C 800/*



Weight 64Kg 140lb

Further details on RE 14 620

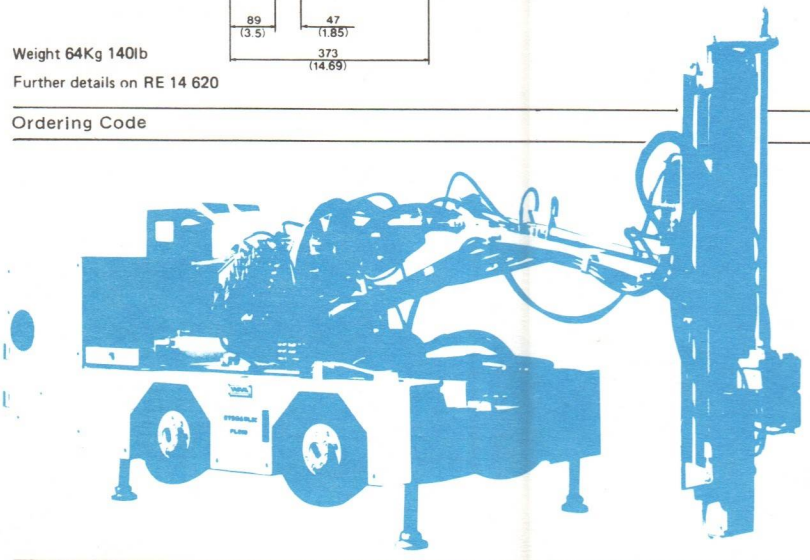
CA 800/*



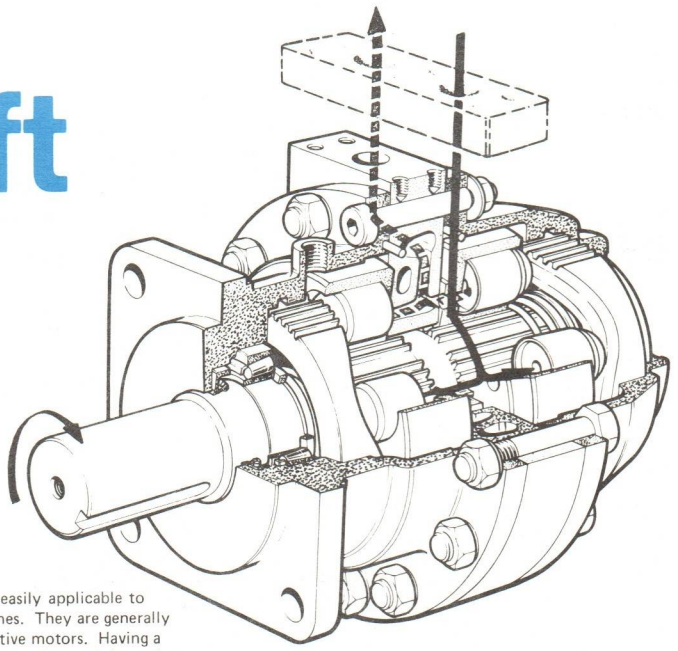
Weight 31Kg 68lb

Further details on RE 14 663

Ordering Code



Rotating Shaft Motors



The new range of low speed rotating shaft motors utilizes the axial piston and cam principle already well proven in the rotating case motors.

The motor has, however, now been separated into two halves by a central oil feed/port plate. The cams are now fixed rigidly into the casings and the cylinder blocks splined onto the shaft. Taper roller bearings absord both torque reaction and externally applied loads.

Oil is fed through the control port plate into the cylinders causing the pistons to bear on the cams and so rotate the cylinder blocks, which in turn rotate the shaft.

Some models, notably the ranges 5, 3 and 1, are single ended motors with only one cylinder block and cam.

ADVANTAGES

* Through shaft available.
* Shaft loading up to 6 tons.
* Freewheeling facility.
* Various brakes may be fitted.
* Hollow shaft available.

APPLICATIONS

Low Speed Shaft Motors are easily applicable to many industrial and mobile machines. They are generally much more compact than competitive motors. Having a torque/weight ratio of up to 60 Nm/Kg (98 lb. ft/lb. wt).

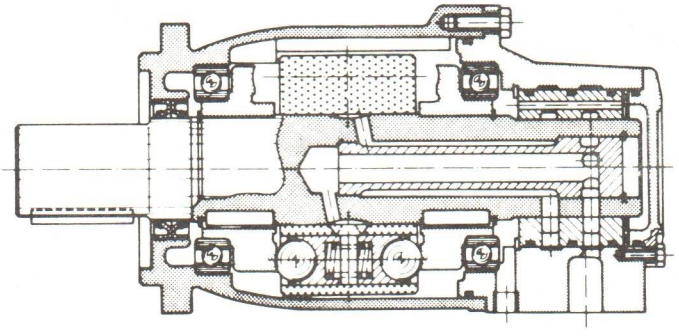
Type S300

Ordering Code

S300 291 *

- **SERIES**
  - 300 rotating shaft motor
- **MOTOR SIZE, See technical data**
  - 182
  - 291
  - 394
  - 442
- **ADDITIONAL INFORMATION**

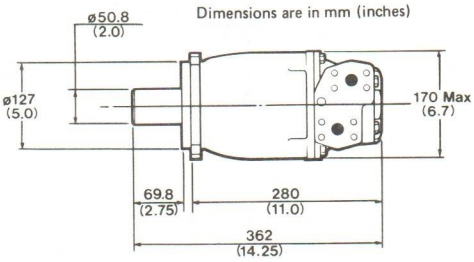
Sectional View



Technical Data

Model	Displacement		Maximum Pressure		Theoretical Specific Torque		Max Speed	Max Radial Load		Approximate Weight	
	cm^3/rev	in^3/rev	bar	psi	Nm / 100bar	lb.ft / 1000psi	R.P.M.	kN	lbs x 1000	kg.	lbs
S300/182	182	11.1	280	4060	289	151.5	550	8	1.79	30	66
S300/291	291	17.75	280	4060	463	235.5	450	8	1.79	30	66
S300/394	394	24	280	4060	626	318	400	8	1.79	30	66
S300/442	443	27	280	4060	704	358	400	8	1.79	30	66

Dimensions are in mm (inches)



Further details on RE 14 508

Type MCS3 thru 6

MCS6 A 765 *

- **MOTOR TYPE**
  - MCS3
  - MCS4
  - MCS5
  - MCS6
- **4 Bolt S.A.E.**
  - Flange mount
  - C
- 4 Bolt S.A.E.
  - Flange mount
  - D
- **DISPLACEMENT (See technical data)**

Frame Size 3	Frame Size 5
145	382
197	442
Frame Size 4	498
291	Frame Size 6
393	765
	884
	996

- **ADDITIONAL INFORMATION**

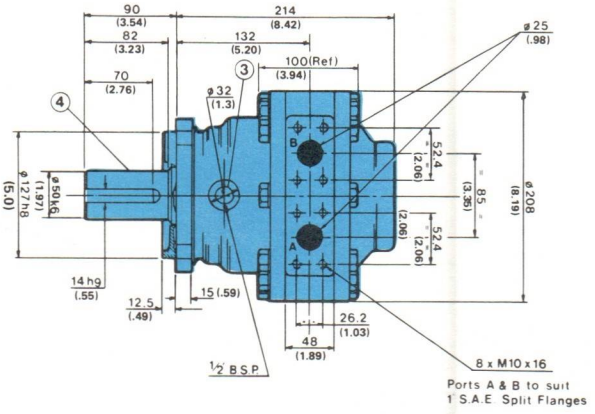
ENGLISH/METRIC Conversion Factors

Pressure	1 bar	14,5038 psi 0,1 M Pa
Mass	1 kilogramme	2,20462 lb
Power	1 kilowatt (kw)	1,34102 HP 1000 Nm/sec
Torque	1 Newton (Nm)	0,73756 lb ft

Volume	1 litre	0,21998 Imp gal 0,26418 US gall 1000 cm^3 61,0237 in^3
	1 Imp. gallon	277,42 in^3
	1 US gallon	231,00 in^3
Length	1 millimetre (m.m.)	0,03937 inch
Force	1 Newton (N)	0,10197 kg force (kilopond) 0,22481 pound force (lbf)

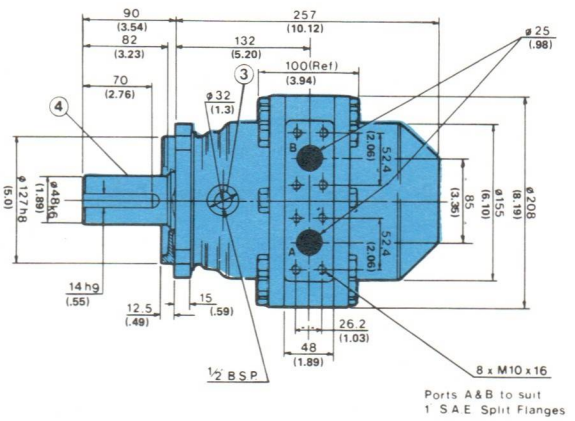
Model	Displacement cm^3/rev	Displacement in^3/rev	Maximum Pressure bar	Maximum Pressure psi	Theoretical Specific Torque Nm 100bar	Theoretical Specific Torque lb.ft 1000psi	Max Speed R.P.M.	Max Radial Load kN	Max Radial Load lbs x 1000	Approximate Weight Kg.	Approximate Weight lbs.
MCS3 A 150	145	8.8	320	4640	200	117	400	22	4.8	29.5	65
MCS3 A 200	197	12	320	4640	312	158	400	22	4.8	29.5	65
MCS4 A 300	291	17.7	320	4640	463	235	400	22	4.8	36.5	80
MCS4 A 400	393	24	320	4640	625	317	350	22	4.8	36.5	80
MCS5 A 382	382	23.3	320	4640	608	310	300	60	13.2	58	128
MCS5 A 442	442	27	320	4640	703	357	300	60	13.2	58	128
MCS5 A 498	498	30.4	320	4640	792	403	300	60	13.2	58	128
MCS6 A 765	765	46.6	320	4640	1216	619	300	60	13.2	80	177
MCS6 A 884	884	54	320	4640	1406	714	300	60	13.2	80	177
MCS6 A 996	996	60.8	320	4640	1584	806	300	60	13.2	80	177

Dimensions are in mm (inches)

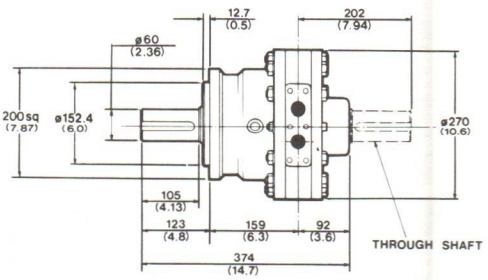


MCS3A

Being phased out of production

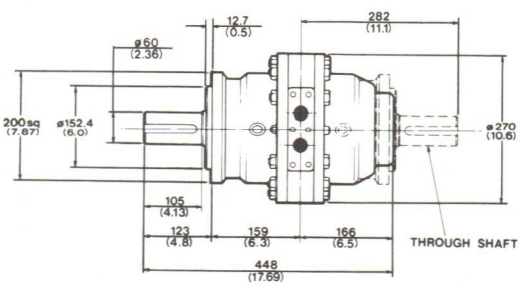


MCS4A



MCS5

Further details on RE 14 250



MCS6

Further details on RE 14 250

MCW WinchMotors

Hydraulic winches are available up to 5 tons nominal line pull and are driven directly by motor cartridge units fitted within the drum.

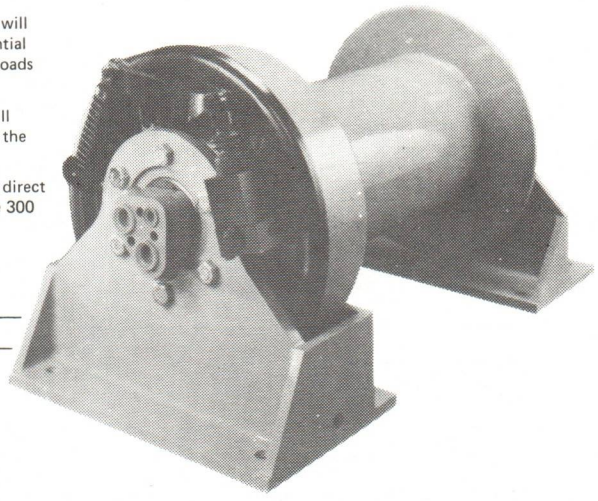
These winch units are designed for pulling duties only and must not be used for suspended loads.

The complete assembly comprises powered drum with brake kit, side stands and over-center valve which controls lowering and brake release. The over-center valve can also be supplied separately.

The static line pull values indicated in the table will restart a suspended load at 210 bar (3040 psi) differential pressure. Somewhat greater values apply to dragging loads and moving suspended loads.

Peak pressure is 250 bar (3620 psi) with line pull proportionally increased. It is possible to freewheel the units when required.

Sizes 10 through 40 have hydraulic motors fitted direct into the drum. Size 50 utilizes a motor cartridge type 300 together with an epicyclic gear reduction of 7.1.



Size 10 to 40

Ordering Code

MCW 10 WA 291 SS 10 B2

FRAME SIZE
- 10 = 10
- 20 = 20
- 40 = 40

NOMINAL RATING (TONS)
- 0.75 = 291
- 1.1 = 442
- 1.3 = 765
- 1.75 = 998
- 2.6 = 1530
- 3.5 = 1992

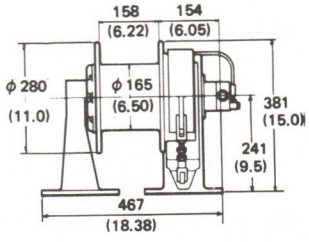
- **DD** = Without side stands, shaft at both ends
- DZ = Without side stands, shaft at one end (Size 10 only)
- SS = With side stand at both ends (braked units only)
- SZ = With single cantilever stand (braked size 10 units only)
- **10** = Design series 10 - 19 installation and connection dimensions remain the same
- **AO** = No brake
- B2 = Band brake

Technical Data

Winch Model	Nominal Rating	Static line pull at 210 bar (3040 psi)				Oil flow for Bare drum speed		Max Drum Speed	Geometric displacement per revolution of drum	
		Bare drum		Full drum		30m/min	100ft/min			
	Ton	kN	lb	kN	lb	lt/min	in^3/rev	RPM	cm^3/rev	in^3/rev
10WA 291	0.75	7.55	1697	5.39	1211	15.9	1040	500	291	17.7
10WA 442	11.0	11.2	2517	8.0	1798	23.4	1541	300	442	27.0
20WA 765	1.3	14.2	3190	9.5	2125	31.8	1980	300	765	46.7
20WA 998	1.75	18.5	4170	12.4	2780	41.7	2590	300	996	61.0
40WA 1530	2.6	28.4	6380	18.9	4250	63.6	3960	300	1530	93.4
40WA 1992	3.5	37.0	8340	24.7	5560	83.4	5175	300	1992	122.0

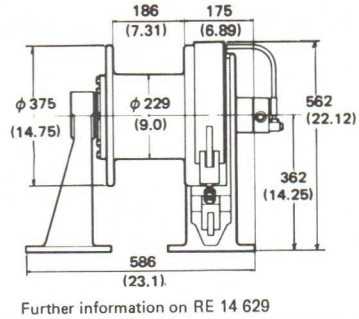
Maximum pressure of all winches 250 bar (3620 psi)

MCW 10



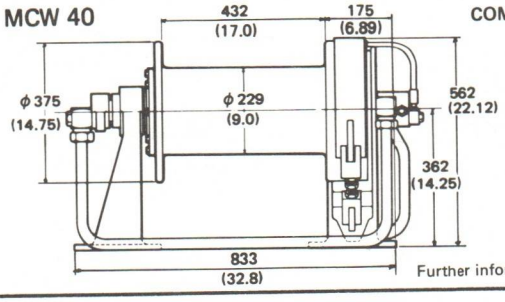
Further information on RE 14 626

MCW 20



Further information on RE 14 629

MCW 40



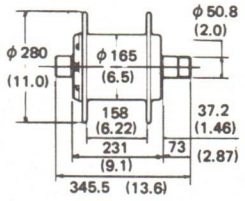
COMPLETE WINCH ASSEMBLIES

Dimensions are in mm (inches)

Further information on RE 14 638

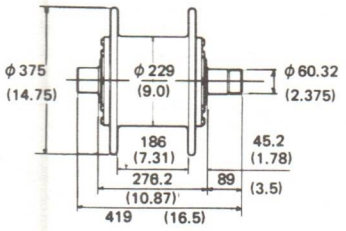
MCW 10

Dimensions are in mm (inches)



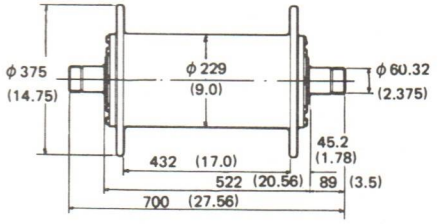
Further information on RE 14 626

MCW 20



Further information on RE 14 629

MCW 40



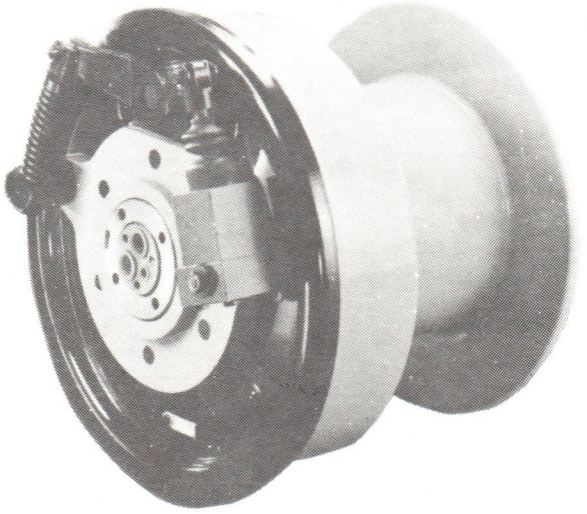
Further information on RE 14 638

Size 50

Ordering Code

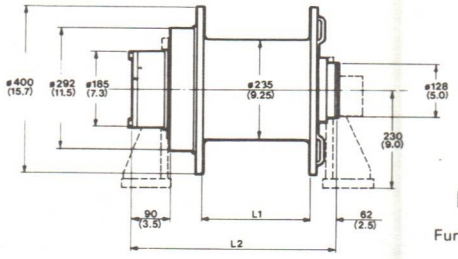
MCW50 02335 A 2030 *ADDITIONAL INFORMATION

- **TYPE**
- **DIAMETER**
  - 0235 = 235 mm
  - 0300 = 0300 mgm
- **BRAKE**
  - A = Without brake
  - B = Multi-disc brake
- **OIL CAPACITY, per rev.**
  - 2030 = 2030 cm^3
  - 2674 = 2674 cm^3
- **ANY OTHER DETAILS**



Technical Data

Winch Model	Nominal Rating	Static line pull at 210 bar (3040 psi)				Oil flow for Bare drum speed		Max Drum Speed	Geometric displacement per revolution of drum	
		Bare drum		Full drum		30m/min	100ft/min			
	Ton	kN	lb	kN	lb	lt/min	in^3/min	RPM	cm^3/rev	in^3/rev
50/0235	3,5	38.5	8653	29.3	6580	82.5	6618	70	2030	123.8
50/0235	4,5	50,7	11400	38.5	8670	108.6	8717	50	2674	163
50/0300	3.0	32.1	7222	24.2	5445	63.7	4006	70	2030	123.8
50/0300	4.0	41.9	9430	31.8	7155	84	5275	50	2674	163

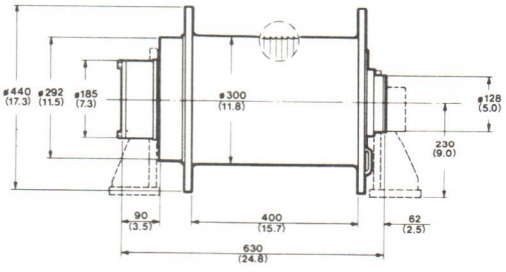


Drum length	L1	L2
260	260 (10.24)	490 (19.3)
400	400 (15.7)	630 (24.8)
630	630 (24.8)	860 (33.9)

MCW50/*/0300

Further details on RE 14 405

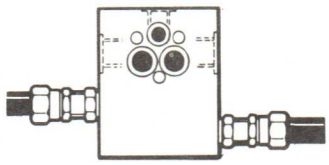
Dimensions are in mm (inches)



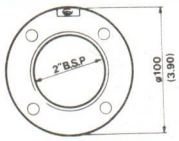
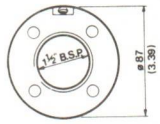
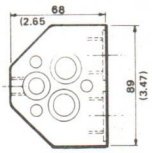
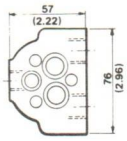
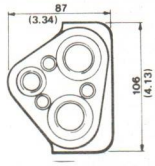
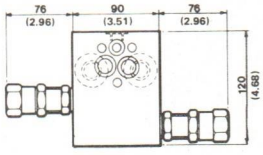
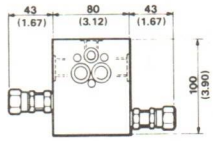
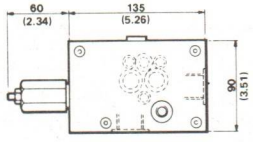
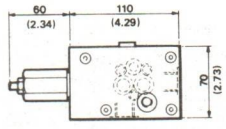
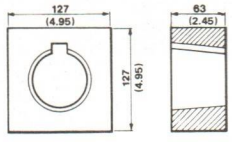
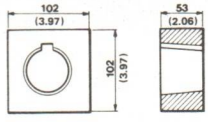
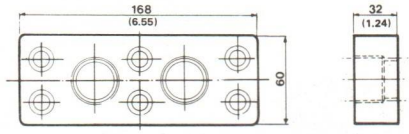
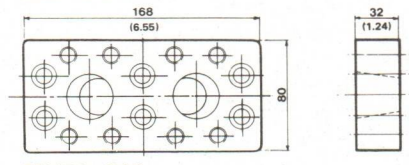
MCW50/*/0235

Further details on RE 14 405

MotorAccessories

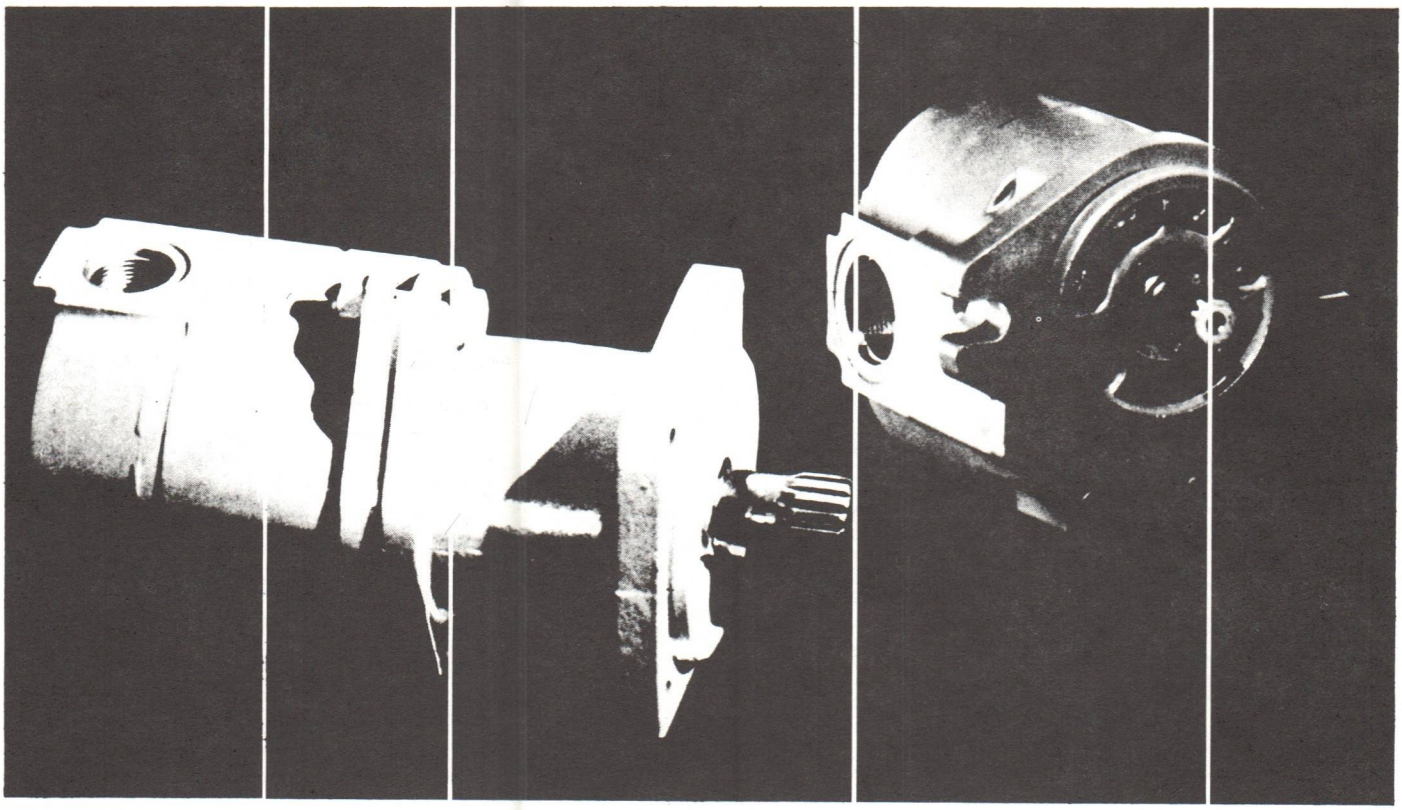


The following range of accessories are available as standard items to make the mounting and application of the motors more convenient.

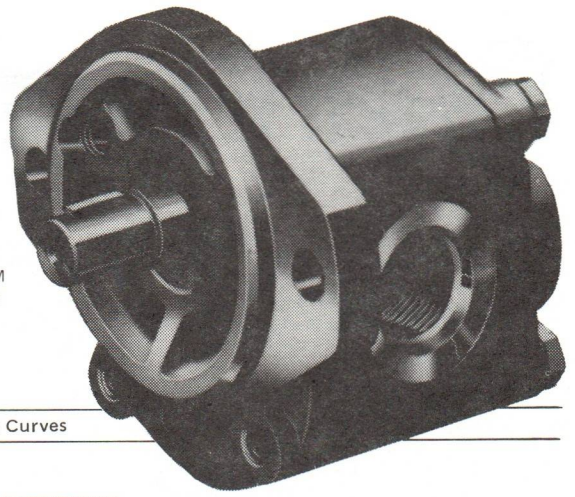
		Rotating Case 800 Motors	Rotating Case 300 Motors
Shaft Lock Nuts	Applicable to all motors.	 PN222 - 0655	 PN221 - 0656
90° Port Blocks	This and the following 4 items are alternative shaft end fittings, which may be used to suit either mounting or circuit circumstances.	 PN222 - 0488	 PN321 - 0423
In Line Port Blocks	This block has better flow passages than the 90° version, and is preferred for high motor speeds.	 PN222 - 0468	Not Available
Cross Line Relief Valves	Designed for use on Closed Loop circuits, or circuits with Closed Center Control Valves. **Not** for winch operation.	 PN0070 - 005	 PN0070 - 006
Winch Valves	Contains Brake Shuttle Valve to control the Safety Brake in both directions of Motor. It also has an Over Center Valve for controlled lowering of load. Available for right and left hand.	 PN0070 - 016	 PN0070 - 014
Mounting Blocks	These are used to mount Taper Shaft Motors in connection with the locknuts shown above. They are of steel and may be bolted or welded to the machine frame.	 PN462 - 0421	 PN362 - 0487
B.S.P. Adaptor Block	For use with steel pipe and smaller flow applications	MCS 5 & 6 Motors  PN171 - 747	
S.A.E. Adaptor Block	For use with flexible pipes or high oil flows. Provides better flow characteristics at high motor speeds.	**MCS 5 & 6 Motors**  PN171 - 746	

Summary | GEAR PUMPS/MOTORS

TYPE	REXROTH CODE	DESIGN	SIZE/CAPABILITY	PAGE NO.
GEAR PUMPS	P2	9 Sizes Available, SAE 2-Bolt Mounting	1.62 to 9.36 GPM @ 1800 RPM up to 2000 PSI up to 4000 RPM	1-41
	S12S	8 Sizes Available SAE AA Mounting	0.9 to 5.2 GPM @ 1800 RPM up to 3000 PSI up to 3500 RPM	1-42
	S15S	6 Sizes Available, SAE A Mounting	3.35 to 9.36 GPM @ 1800 RPM up to 3000 PSI up to 3500 RPM	1-43
	S20S	5 Sizes Available, SAE A or B, 2-Bolt Mounting	8.10 to 18.0 GPM @ 1800 RPM up to 3000 PSI up to 3500 RPM	1-44
	S30S	6 Sizes Available, SAE A or B, 2-Bolt Mounting	11.88 to 29.52 GPM @ 1800 RPM up to 3000 PSI up to 3000 RPM	1-45
GEAR MOTOR	M15S	6 Sizes Available, SAE A, 2-Bolt Mounting Up to 20 HP Input	.43 to 1.20 cu. in/rev up to 3000 PSI up to 3000 RPM	1-46
	M30S	6 Sizes Available, SAE B, 2-Bolt Mounting up to 55 HP Input	1.52 to 3.80 cu. in/rev up to 3000 PSI up to 3000 RPM	1-47



GearPump



- Nine sizes from 1.62 to 9.36 GPM (0.9 to 5.2 GPM –SAE/NFPA volumetric rating - (1000 RPM and 100 PSI)
- Mounting flange – SAE A 2-bolt mount
- Shaft end – spline or keyed
- Side or rear ports are SAE straight thread "O" ring bosses
- Clockwise or counterclockwise rotation (as viewed from shaft end)
- Speed range: minimum – 1000 RPM
  maximum – P2-2 to P2-8 – 4000 RPM
  P2-9 – 3500 RPM P2-10 – 3000 RPM
  Note: For speeds above 3000 RPM, consult Rexroth
- Average weight – 5 lbs.

Series P2

Refer To RA 64723

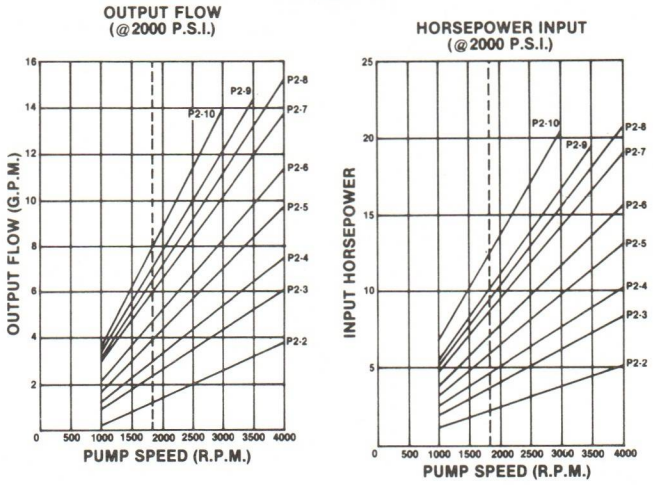
Up to 2000 PSI Up to 4000 RPM
1.62 to 9.36 GPM @ 1800 RPM

Ordering Code

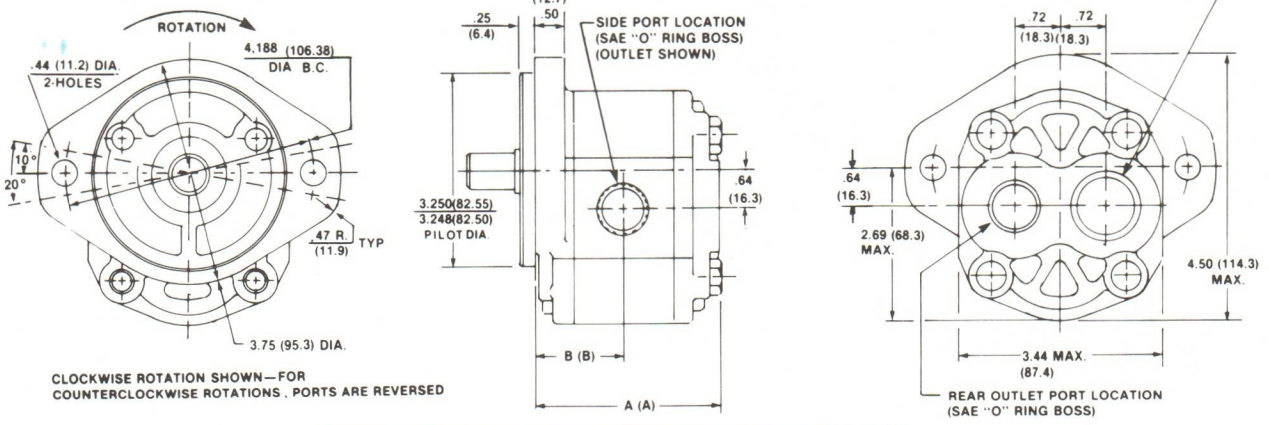
P2 2 A H 2 1 R

- **SERIES NUMBER**
- **CAPACITY**
  In GPM 1800 RPM & 100 PSI
- **PORT LOCATION**
  A = Ports in side
  D = Ports in rear
- **MOUNTING PAD**
  H = SAE
  A = 2-Bolt
- **SHAFT END**
  1 = Spline
  2 = Keyed
- **DESIGN NO.**
- **ROTATION**
  R = Right hand (clockwise)
  L = Left hand (counterclockwise)

Performance Curves



Dimensional Data



SPECIFICATION DATA

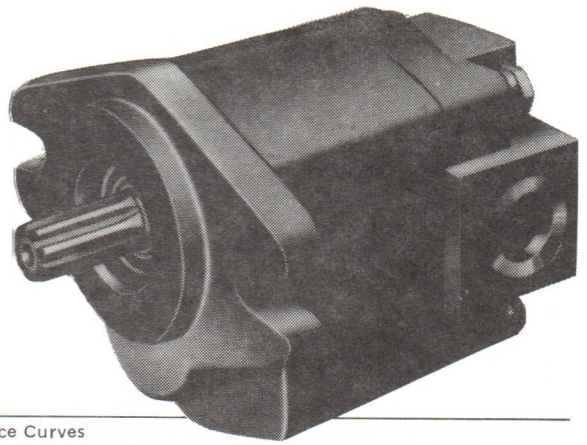
MODEL	DISPLACEMENT CU IN /REV	@ 1800 RPM & 100 PSI GPM	PRESSURE RATING PSI UP TO	A	(A)	B	(B)	INLET PORT	OUTLET PORT
P2-2	.21	1.62	2000	3.09	(78.5)	1.44	(36.6)	.750-16UN	.562-18UN
P2-3	.36	2.70	2000	3.38	(85.9)	1.52	(38.6)	.875-14UN	.750-16UN
P2-4	.45	3.42	2000	3.34	(84.8)	1.56	(39.6)	.875-14UN	.750-16UN
P2-5	.58	4.50	2000	3.50	(88.9)	1.62	(41.1)	1.062-12UN	.750-16UN
P2-6	.69	5.37	2000	3.62	(91.9)	1.67	(42.4)	1.062-12UN	.750-16UN
P2-7	.85	6.62	2000	3.72	(94.5)	1.75	(44.5)	1.062-12UN	.750-16UN
P2-8	.92	7.16	2000	3.84	(97.5)	1.79	(45.5)	1.062-12UN	.750-16UN
P2-9	1.00	7.74	2000	3.88	(98.6)	1.83	(46.5)	1.062-12UN	.750-16UN
P2-10	1.20	9.35	2000	4.12	(104.6)	1.92	(48.8)	1.312-12UN	.875-14UN

NOTE: PARENTHETICAL DIMENSIONS ARE IN MILLIMETERS.

Data obtained at 2000 PSI with oil of fluid viscosity 95-115 SUS at 120°F (150 SUS at 100°F). Ratings as indicated on graphs show performance of typical production units.

NOTE: All specifications and performance ratings shown herein are subject to change without notice. For operational data in blank areas, consult the Rexroth Corporation.

GearPump



- Eight sizes from 0.90 to 5.22 GPM (0.5 to 2.9 GPM –SAE/NFPA volumetric rating - (1000 RPM and 100 PSI)
- Mounting flange – SAE AA
- Shaft end – keyed, spline, or tang
- Side or rear ports are SAE straight thread
- Clockwise or counterclockwise rotation
- Average weight – 1.5 to 3.0 lbs.

Series S12S

Refer To RA 64750

Up to 3000 PSI Up to 3500 RPM
0.9 to 5.2 GPM @ 1800 RPM

Ordering Code

S12S 32 A K 2 5 R *Indicates Stocked Items

SERIES NUMBER
*S12 = Pump (without relief valve)

CAPACITY
In tenths of a GPM – 1800 RPM & 100 PSI

PORT LOCATION
*A = Ports in side
D = Ports in rear

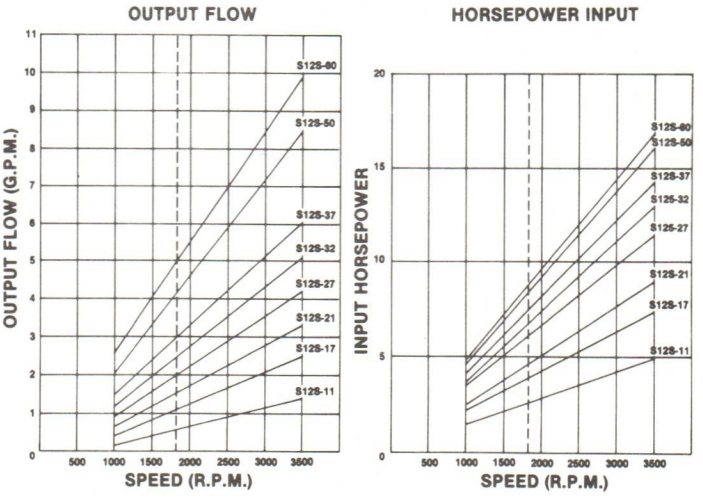
MOUNTING PAD
*K = SAE
AA = 2-Bolt

SHAFT END
1 = Spline
*2 = Keyed – short
6 = Tang
7 = Keyed – long

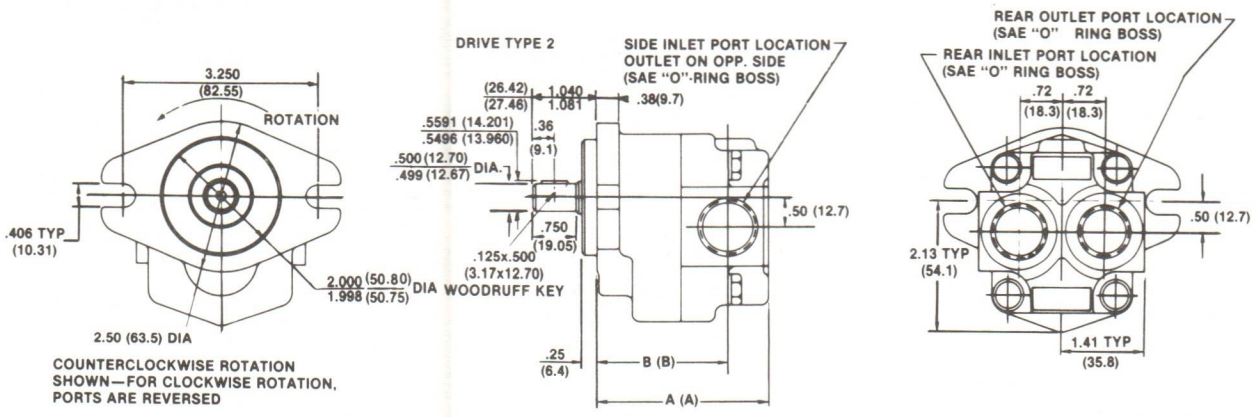
DESIGN NO.

ROTATION
*R = Right hand (clockwise)
*L = Left hand (counterclockwise)

Performance Curves



Dimensional Data



SPECIFICATION DATA

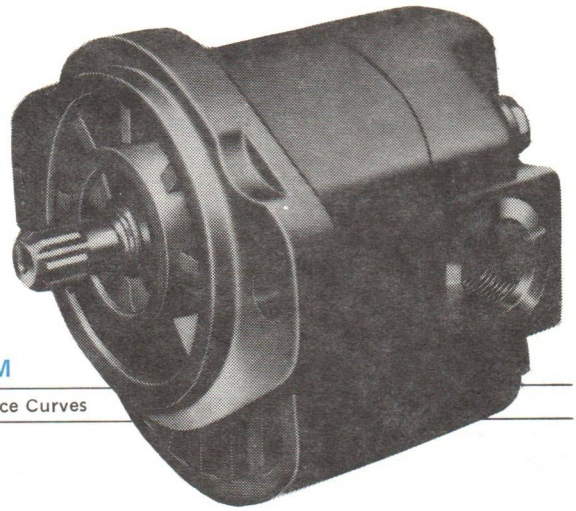
MODEL	DISPLACEMENT CU IN/REV	@ 1800 RPM & 100 PSI GPM	PRESSURE RATING PSI UP TO	A	(A)	B	(B)	INLET PORT	OUTLET PORT
S12S-11	.122	.90	3000	2.92	(74.2)	2.24	(56.9)	.750-16UN	.562-18UN
S12S-17	.188	1.44	3000	3.04	(77.2)	2.36	(59.9)	.750-16UN	.562-18UN
*S12S-21	.244	1.90	3000	3.15	(80.0)	2.47	(62.7)	.750-16UN	.562-18UN
*S12S-27	.305	2.37	3000	3.26	(82.8)	2.58	(65.5)	.750-16UN	.562-18UN
*S12S-32	.366	2.85	3000	3.38	(85.9)	2.70	(68.6)	.875-14UN	.750-16UN
S12S-37	.430	3.35	3000	3.50	(88.9)	2.81	(71.4)	.875-14UN	.750-16UN
S12S-50	.580	4.50	2500	3.78	(96.0)	3.09	(78.5)	.875-14UN	.750-16UN
S12S-60	.680	5.22	2250	3.96	(100.6)	3.28	(83.3)	.875-14UN	.750-16UN

Illustrated output flow and input horsepower requirements are at 3000 PSI except the S12S-50 which is rated at 2500 PSI and the S12S-60 which is rated at 2250 PSI.

NOTE: All specifications and performance ratings shown herein are subject to change without notice. For operational data in blank areas, consult the Rexroth Corporation.

GearPump

- Six sizes from 3.35 to 9.35 GPM (1.9 to 5.2 GPM – SAE/NFPA volumetric rating - (1000 RPM and 100 PSI)
- Mounting flange – SAE A
- Shaft end – spline or keyed
- Side or rear ports are SAE straight thread "O" ring bosses
- Clockwise or counterclockwise rotation (as viewed from shaft end)
- Speed range: minimum – 700 RPM
  maximum – S15S-4 to S15S-7 – 3500 RPM
  S15S-9 and S15S-10 – 3000 RPM
- Average weight – 4.5 to 6 lbs.



Series S15S

Refer To RA 64756

Up to 3000 PSI and 3500 RPM
3.35 to 9.36 GPM – @ 1800 RPM

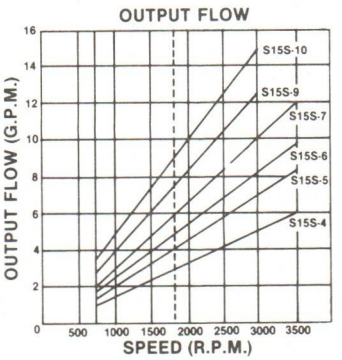
Ordering Code

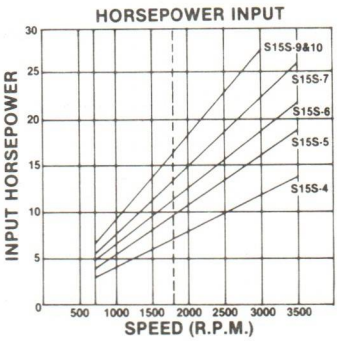
S15S 10 A H 2 3 R

*Indicates Stocked Items

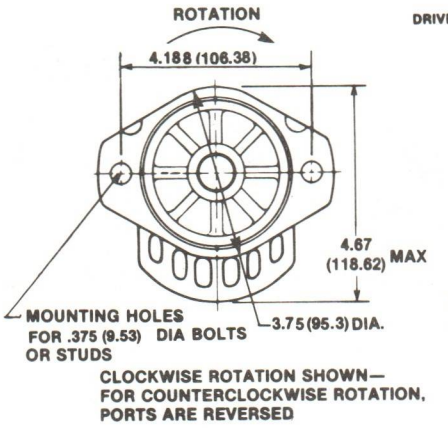
- SERIES NUMBER
- CAPACITY
  In GPM – 1800 RPM & 100 PSI
- PORT LOCATION
  *A = Ports in side
  D = Ports in rear
- MOUNTING PAD
  *H = SAE
  A = 2-Bolt
- SHAFT END
  1 = Spline
  *2 = Keyed – short
  7 = Keyed – long
- DESIGN NO.
- ROTATION
  *R = Right hand (clockwise)
  *L = Left hand (counterclockwise)

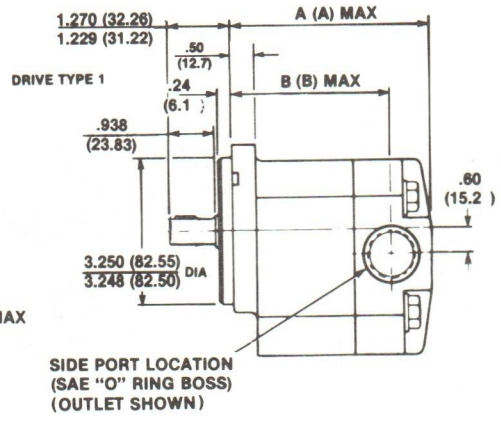
Performance Curves

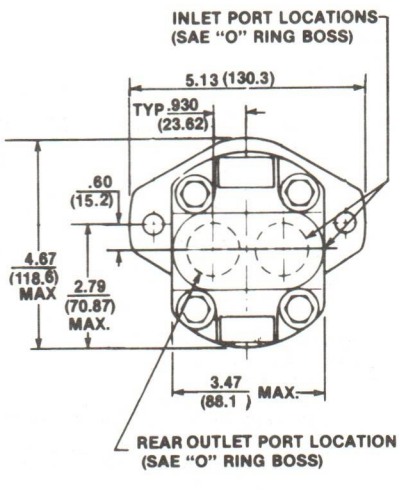




Dimensional Data


ROTATION
4.188 (106.38)
4.67 (118.62) MAX
MOUNTING HOLES FOR .375 (9.53) DIA BOLTS OR STUDS
3.75 (95.3) DIA.
CLOCKWISE ROTATION SHOWN— FOR COUNTERCLOCKWISE ROTATION, PORTS ARE REVERSED





NOTE: PARENTETICAL DIMENSIONS ARE IN MILLIMETERS

SPECIFICATION DATA

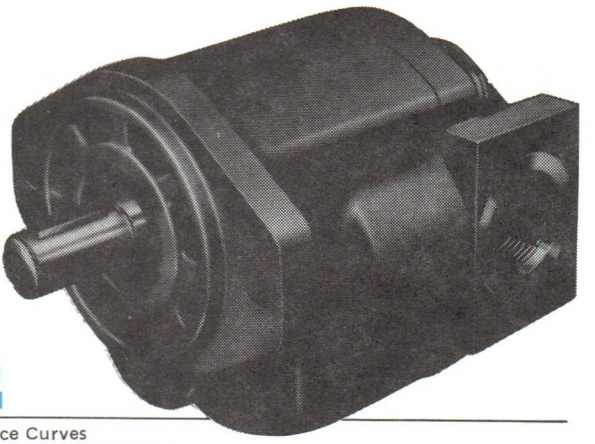
MODEL	DISPLACEMENT CU.IN./REV.	SAE/NFPA VOLUMETRIC RATING @ 1800 RPM & 100 PSI GPM	PRESSURE RATING PSI UP TO	A	(A)	B	(B)	INLET PORT	OUTLET PORT
*S15S-4	.43	3.35	3000	3.48	(88.4)	2.63	(66.8)	1.062-12UN	.875-14UN
*S15S-5	.58	4.50	3000	3.63	(92.2)	2.78	(70.6)	1.062-12UN	.875-14UN
*S15S-6	.68	5.22	3000	3.73	(94.7)	2.88	(73.2)	1.062-12UN	.875-14UN
*S15S-7	.81	6.30	3000	3.86	(98.0)	3.03	(77.0)	1.062-12UN	.875-14UN
*S15S-9	1.00	7.74	3000	4.06	(103.1)	3.21	(81.5)	1.062-12UN	.875-14UN
*S15S-10	1.20	9.36	2500	4.26	(108.2)	3.41	(86.6)	1.062-12UN	.875-14UN

Illustrated output flow and input horsepower requirements are at 3000 PSI except the S15S-10 which is rated at 2500 PSI.

NOTE: All specifications and performance ratings shown herein are subject to change without notice. For operational data in blank areas, consult the Rexroth Corporation.

GearPump

- Five sizes from 8.10 to 18.0 GPM (4.5 to 10.0 GPM SAE/NFPA volumetric rating - (1000 RPM and 100 PSI)
- Mounting flange – SAE A or B 2-bolt mount
- Shaft end – spline, straight with key, or tapered with key
- Side or rear ports are SAE straight thread "O" ring bosses
- Clockwise or counterclockwise rotation
- Speed range: minimum – 500 RPM
  maximum – S20S-9 – 3500 RPM
  S20S-12 & 15 – 3000 RPM
  S20S-17 & 20 – 2500 RPM
- Average weight – 8 to 11 lbs.



Series S20S

Refer To RA 64774

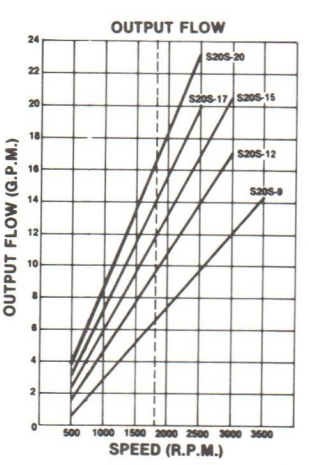
Up to 3000 PSI Up to 3500 RPM
8.10 to 18.0 GPM – @ 1800 RPM

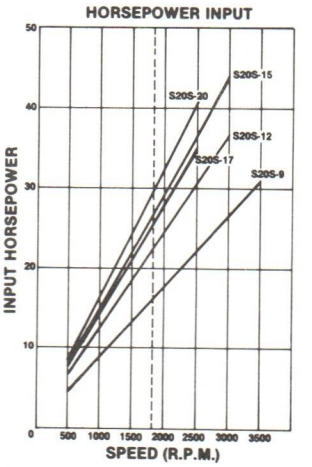
Ordering Code

S20S 15 A H 2 1 R *Indicates Stocked Items

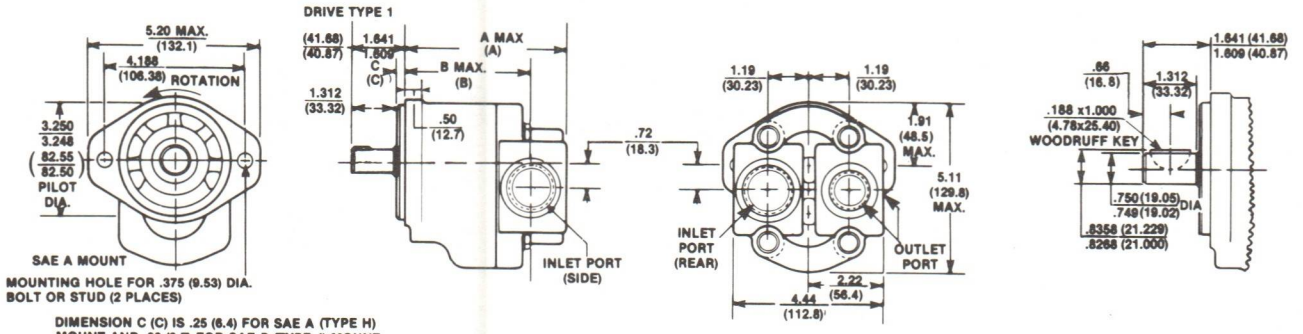
- **SERIES NUMBER**
- **CAPACITY**
  In GPM – 1800 RPM & 100 PSI
- **PORT LOCATION**
  *A = Ports in side
  D = Ports in rear
- **MOUNTING PAD**
  *H = SAE A = 2-Bolt
  J = SAE B = 2-Bolt
- **SHAFT END**
  1 = Spline – 13-tooth
  *2 = Keyed
  8 = Tapered with key
  9 = Spline – 11-tooth
- **DESIGN NO.**
- **ROTATION**
  *R = Right hand (clockwise)
  *L = Left hand (counterclockwise)

Performance Curves





Dimensional Data



DIMENSION C (C) IS .25 (6.4) FOR SAE A (TYPE H) MOUNT AND .38 (9.7) FOR SAE B (TYPE J) MOUNT.

COUNTERCLOCKWISE ROTATION SHOWN— FOR CLOCKWISE ROTATION, PORTS ARE REVERSED

NOTE: PARENTHETICAL DIMENSIONS ARE IN MILLIMETERS.

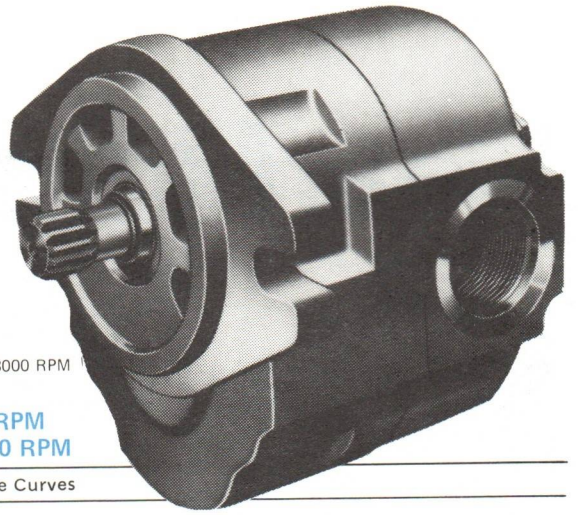
SPECIFICATION DATA

MODEL	DISPLACEMENT CU.IN./REV	@ 1800 RPM & 100 PSI GPM	PRESSURE RATING PSI UP TO	A	(A)	B	(B)	INLET PORT	OUTLET PORT
S20S-9	1.04	8.10	3000	4.62	(117.4)	3.55	(90.2)	1.312-12UN	1.062-12UN
*S20S-12	1.45	11.29	3000	4.94	(125.5)	3.85	(97.8)	1.312-12UN	1.062-12UN
*S20S-15	1.74	13.50	3000	5.16	(131.1)	4.07	(103.4)	1.625-12UN	1.312-12UN
*S20S-17	2.02	15.66	2500	5.38	(136.7)	4.29	(109.0)	1.625-12UN	1.312-12UN
S20S-20	2.32	18.00	2500	5.59	(142.0)	4.51	(114.6)	1.625-12UN	1.312-12UN

Illustrated output flow and input horsepower requirements are at 3000 PSI except the S20S-17 and S20S-20 which are rated at 2500 PSI.

NOTE: All specifications and performance ratings shown herein are subject to change without notice. For operational data in blank areas, consult the Rexroth Corporation.

GearPump



- Six sizes from 11.88 to 29.52 GPM (6.6 to 16.4 GPM – SAE/NFPA volumetric rating - (1000 RPM and 100 PSI)
- Mounting flange – SAE A or B 2-bolt
  Shaft end – spline, straight with key, or tapered with key
- Average Weight – 15 to 18 lbs
- Side or rear ports are SAE straight thread "O" ring bosses
- Clockwise or counterclockwise rotation (as viewed from shaft end)
- Speed range: minimum – 700 RPM
  maximum – S30S-13 through S30S-29 – 3000 RPM
  S30S-33 – 2500 RPM

Series S30S

Refer To RA 64789

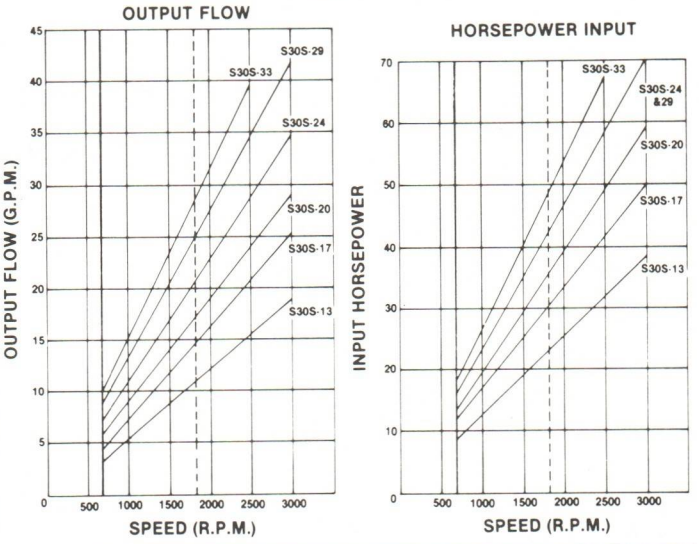
Up to 3000 PSI Up to 3000 RPM
11.88 to 29.52 GPM – @ 1800 RPM

Ordering Code

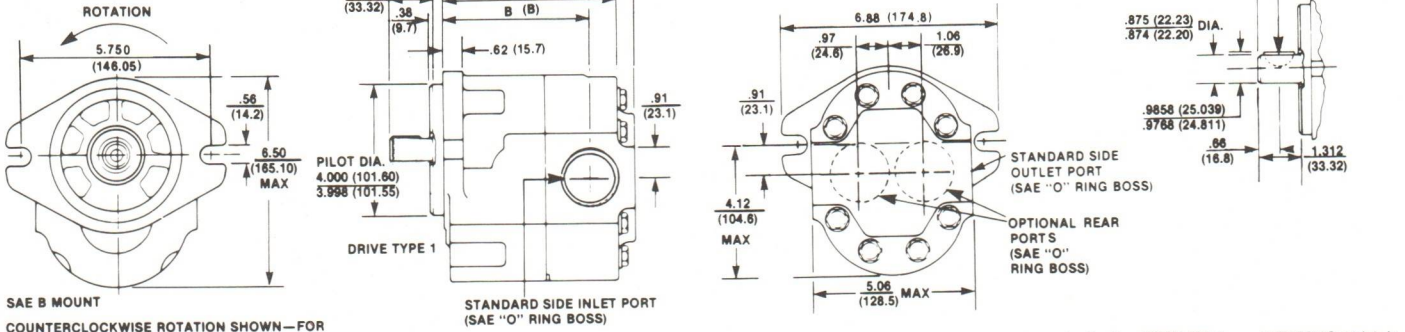
S30S 33 A J 2 2 R *Indicates Stocked Items

- **SERIES NUMBER**
- **CAPACITY**
  In GPM – 1800 RPM & 100 PSI
- **PORT LOCATION**
  * A = Ports in side
  D = Ports in rear
- **MOUNTING PAD**
  H = SAE A = 2-Bolt
  * J = SAE B = 2-Bolt
- **SHAFT END**
  1 = Spline
  * 2 = Straight, keyed – short
  7 = Straight, keyed – long
  8 = Tapered with key
- **DESIGN NO.**
- **ROTATION**
  * R = Right hand (clockwise)
  * L = Left hand (counterclockwise)

Performance Curves



Dimensional Data



NOTE: PARENTHETICAL DIMENSIONS ARE IN MILLIMETERS.

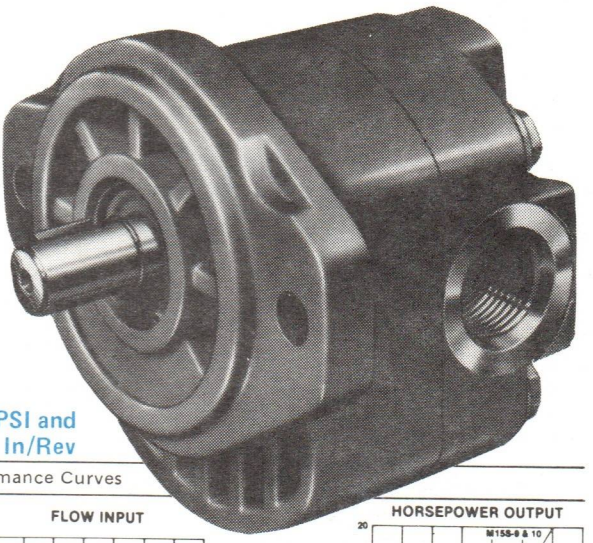
Illustrated output flow and input horsepower requirements are at 3000 PSI except the S30S-29 and S30S-33 which are rated at 2500 PSI.

Data obtained at 3000 PSI (except M15S-10 which is rated at 2500 PSI) with oil of fluid viscosity 95-115 SUS at 120°F (150 SUS at 100°F). Ratings as indicated on graphs show performance of typical production units.

SPECIFICATION DATA

MODEL	DISPLACEMENT CU. IN./REV.	RATING @ 1800 RPM & 100 PSI GPM	PRESSURE RATING PSI UP TO	A	(A)	B	(B)	C	(C)	SIDE PORTS INLET	SIDE PORTS OUTLET	REAR PORTS INLET	REAR PORTS OUTLET
S30S-13	1.52	11.84	3000	5.55	(141.0)	4.16	(105.7)	5.05	(128.3)	1.625-12UN	1.312-12UN	1.625-12UN	1.312-12UN
S30S-17	1.95	15.12	3000	5.74	(145.8)	4.35	(110.5)	5.24	(133.1)	1.625-12UN	1.312-12UN	1.625-12UN	1.312-12UN
*S30S-20	2.32	18.00	3000	5.91	(150.1)	4.51	(114.6)	5.41	(137.4)	1.625-12UN	1.312-12UN	1.625-12UN	1.312-12UN
*S30S-24	2.74	21.35	3000	6.10	(154.9)	4.70	(119.4)	5.60	(142.2)	1.875-12UN	1.625-12UN	1.625-12UN	1.312-12UN
*S30S-29	3.30	25.74	2500	6.34	(161.0)	4.95	(125.7)	5.84	(148.3)	1.875-12UN	1.625-12UN	1.625-12UN	1.312-12UN
*S30S-33	3.80	29.52	2500	6.57	(166.9)	5.17	(131.3)	6.07	(154.2)	1.875-12UN	1.625-12UN	1.625-12UN	1.312-12UN

GearMotor



- Six sizes from .43 to 1.20 cu. in/rev (1.9 to 5.2 GPM – SAE/NFPA volumetric rating - (1000 RPM and zero torque on shaft)
- Mount flange – SAE A-2 Bolt
- Shaft end – spline or keyed
- Side or rear ports are SAE straight thread "O" ring bosses
- Motor is bi-rotational
- Average weight – 4.5 to 8 lbs.

Series M15S

Refer To RA 64870

Up to 20 HP Output, 3000 PSI and 3000 RPM .43 to 1.20 Cu. In/Rev

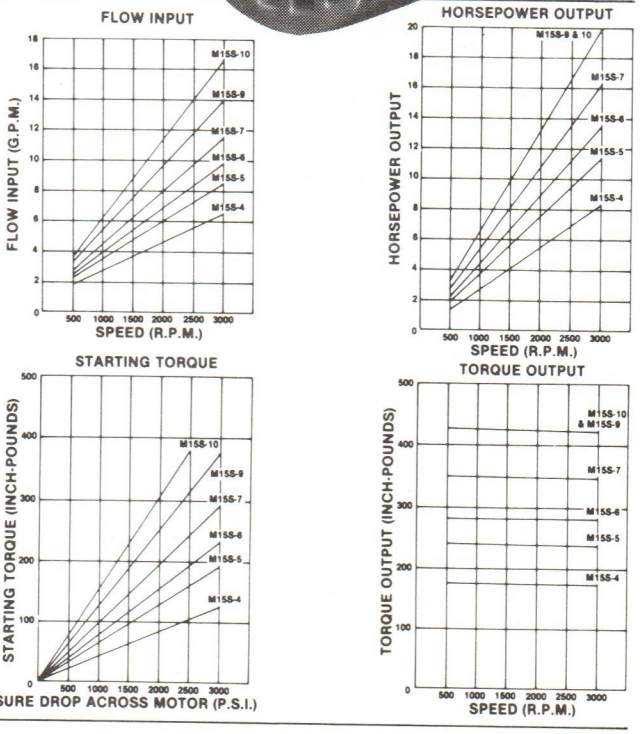
Ordering Code

M15S 10 A H 2 3 B

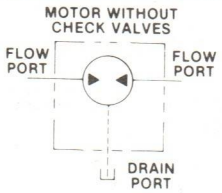
*Indicates Stocked Items

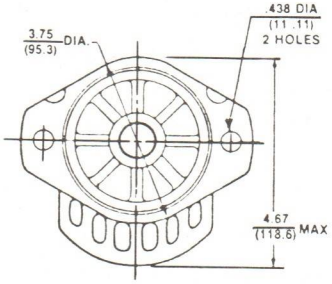
- **SERIES NUMBER**
  - *M15S = Motor without check valves
- **MOTOR SIZE**
- **PORT LOCATION**
  - *A = Ports in side
  - D = Ports in rear
- **MOUNTING PAD**
  - *H = SAE
  - A = 2-Bolt
- **DRIVE SHAFT**
  - 1 = Spline
  - *2 = Keyed – short
  - 7 = Keyed – long
- **DESIGN NO.**
- **ROTATION VIEWED FROM DRIVE END**
  - *B = Bi-rotational

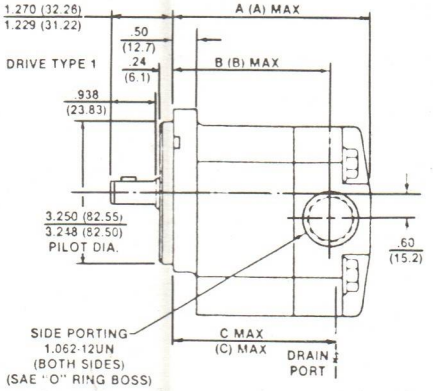
Performance Curves

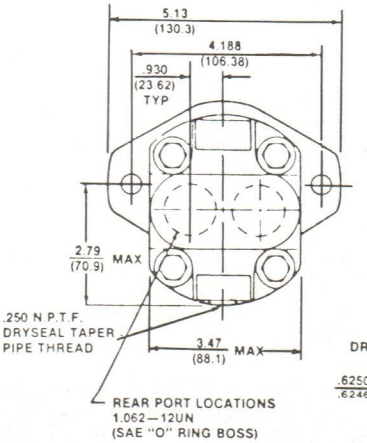


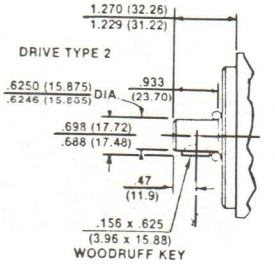
Dimensional Data











SPECIFICATION DATA

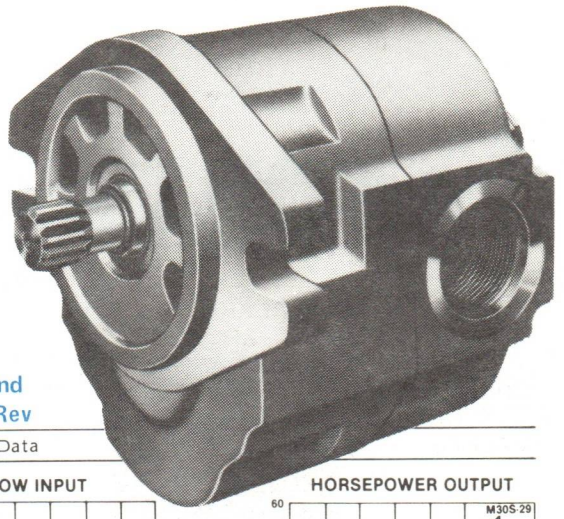
MODEL	DISPLACEMENT CU.IN./REV.	SAE/NFPA VOLUMETRIC RATING @1000 RPM & 100 PSI GPM	PRESSURE RATING PSI UP TO	A	(A)	B	(B)	C	(C)
*M15S-4	.43	1.9	3000	3.48	(88.4)	2.63	(66.8)	2.75	(69.9)
*M15S-5	.58	2.5	3000	3.63	(92.2)	2.78	(70.6)	2.90	(73.7)
*M15S-6	.68	2.9	3000	3.73	(94.7)	2.88	(73.2)	3.00	(76.2)
*M15S-7	.81	3.5	3000	3.86	(98.0)	3.03	(77.0)	3.15	(80.0)
*M15S-9	1.00	4.3	3000	4.06	(103.1)	3.21	(81.5)	3.33	(84.6)
*M15S-10	1.20	5.2	2500	4.26	(108.2)	3.41	(86.6)	3.53	(89.7)

Illustrated output flow and input horsepower requirements are at 3000 PSI except the S15S-10 which is rated at 2500 PSI.

NOTE: All specifications and performance ratings shown herein are subject to change without notice. For operational data in blank areas, consult the Rexroth Corporation.

GearMotor

- Six sizes from 1.52 to 3.80 cu. in/rev (6.6 to 16.4 GPM – SAE/NFPA volumetric rating - (1000 RPM and zero torque on shaft)
- Mounting flange – SAE B 2-bolt
- Shaft end – spline or keyed
- Side or rear ports with SAE straight thread "O" ring bosses
- Motor is bi-rotational
- Average weight – 15 to 18 lbs.



Series M30S

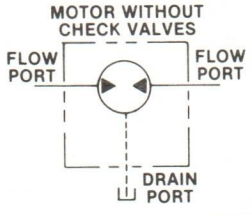
Refer To RA 64882

Up to 55 HP Output, 3000 PSI and 3000 RPM 1.52 to 3.80 Cu. In/Rev

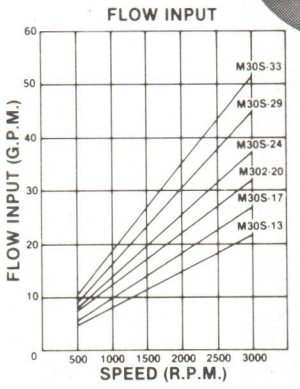
Ordering Code

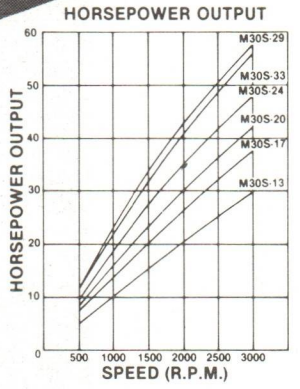
M30S 33 A J 2 3 B *Indicates Stocked Item

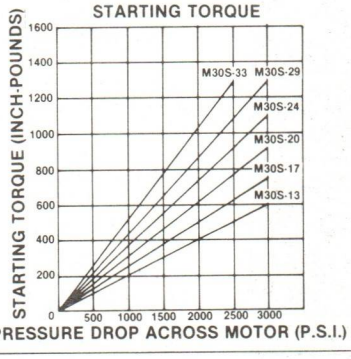
- SERIES NUMBER
  - *M30S = Motor without check valves
- MOTOR SIZE
- PORT LOCATION
  - *A = Ports in side
  - D = Ports in rear
- MOUNTING PAD
  - *J = SAE
  - B = 2-Bolt
- SHAFT END
  - 1 = Spline
  - *2 = Keyed – short
  - 7 = Keyed – long
- DESIGN NO.
- ROTATION
  - *B = Bi-rotational

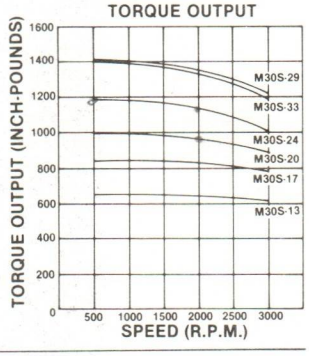


Performance Data

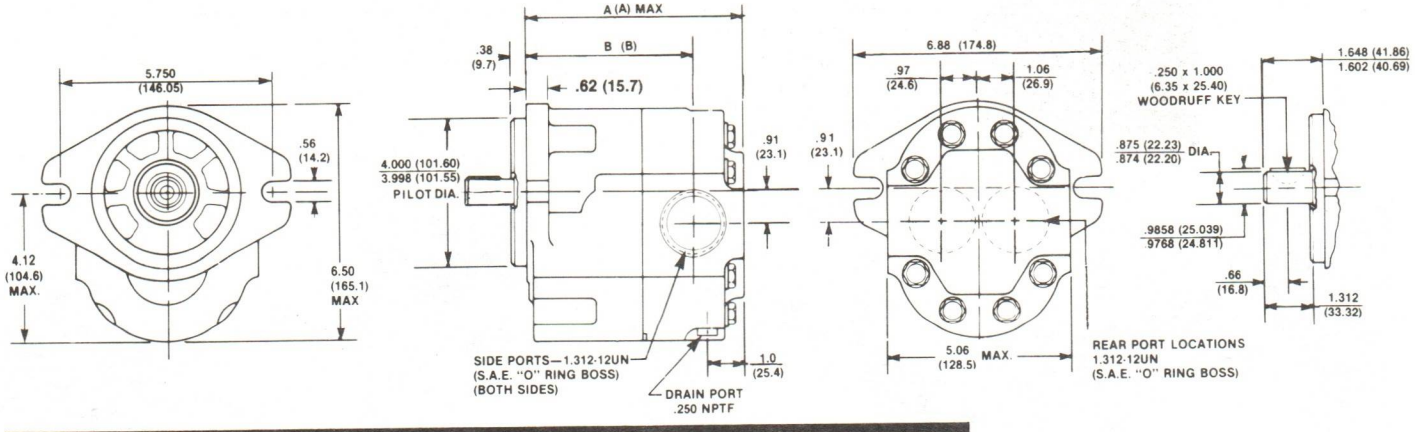








Dimensional Data



SPECIFICATION DATA MODEL	DISPLACEMENT CU.IN./REV.	SAE/NFPA VOLUMETRIC RATING @1000 RPM & 100 PSI GPM	PRESSURE RATING PSI UP TO	A	(A)	B	(B)
*M30S-13	1.52	6.6	3000	5.68	(144.3)	4.29	(109.0)
*M30S-17	1.95	8.4	3000	5.87	(149.1)	4.48	(113.8)
*M30S-20	2.32	10.0	3000	6.04	(153.4)	4.64	(117.9)
*M30S-24	2.74	11.9	3000	6.23	(158.2)	4.83	(122.7)
*M30S-29	3.30	14.3	3000	6.47	(164.3)	5.08	(129.0)
*M30S-33	3.80	16.4	2500	6.70	(170.2)	5.30	(134.6)

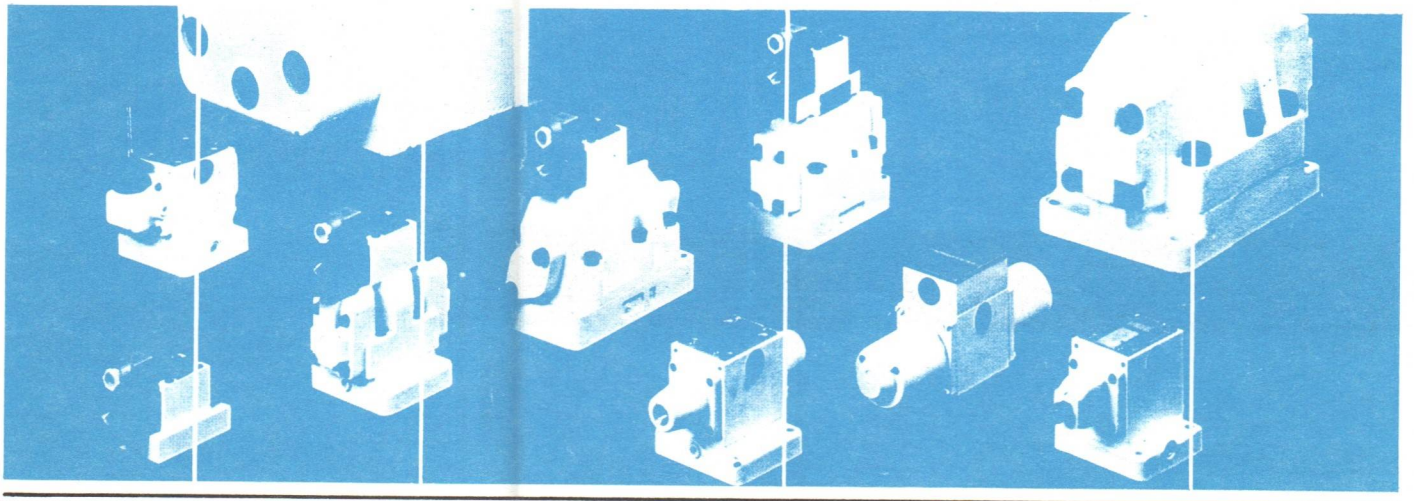
NOTE: PARENTHETICAL DIMENSIONS ARE IN MILLIMETERS.

Data obtained at 3000 PSI (except M30S-33 which is rated at 2500 PSI) with oil of fluid viscosity 95-115 SUS at 120°F (150 SUS at 100°F). Ratings as indicated on graphs show performance of typical production units.

NOTE: All specifications and performance ratings shown herein are subject to change without notice. For operational data in blank areas, consult the Rexroth Corporation.

Summary | DIRECTIONAL CONTROL VALVES

TYPE	REXROTH CODE	DESIGN	SIZE/CAPABILITY	PAGE NO.
DIRECTIONAL CONTROL VALVES	SE	Solenoid	6 (1/4") up to 4 GPM/9000 PSI	2-1
	SE	Solenoid	10 (1/2") D02 up to 8 GPM/9000 PSI	2-2
	WE WH WP/WN WMM WMR WMD	Solenoid Hydraulic Pilot Pneumatic Pilot Manual - Hand Lever Manual - Roller Cam Manual - Rotary Knob	6 (1/4") D01 up to 16 GPM/5000 PSI	2-3 to 2-6
	WE WH WP/WN WMM WMR/WMU WMD/WMDA	Solenoid Hydraulic Pilot Pneumatic Pilot Manual - Hand Lever Manual - Roller Cam Manual - Rotary Knob	10 (1/2") D02 up to 26 GPM/5000 PSI	2-1 to 2-9
	5WE	Solenoid (5 Chamber)	10 (1/2") D02 up to 26 GPM/5000 PSI	2-10 to 2-12
	WEH WH	Solenoid/Pilot Hydraulic Pilot	10 (1/2") D02 up to 43 GPM/5000 PSI	2-13 to 2-15
	WEH WH WMM	Solenoid/Pilot Hydraulic Pilot Manual - Hand Lever	16 (3/4") D04 up to 64 GPM/5000 PSI	2-16 to 2-18
	WEH WH	Solenoid/Pilot Hydraulic Pilot	22 (1") DO6 up to 105 GPM/3000 PSI	2-19 to 2-21
	WEH WH WMM	Solenoid/Pilot Hydraulic Pilot Manual - Hand Lever	25 (1") DO6 up to 172 GPM/4000 PSI	2-22 to 2-24
	WEH WH WMM	Solenoid/Pilot Hydraulic Pilot Manual - Hand Lever	32 (1-1/2") D10 up to 290 GPM/5000 PSI	2-25 to 2-28
		REXROTH Large Valve Capabilities	(2-1/2" thru 4") up to 1852 GPM/5000 PSI	2-30



Directional Control Valve

Direct Operated Type 3SE6 3SE10

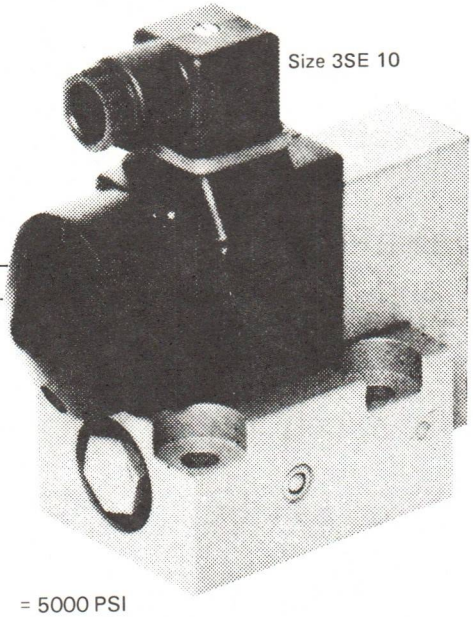
up to 4GPM
up to 9000 PSI

The poppet in this valve is ball shaped. In starting position the poppet (ball) is held against the valve seat by a spring, thus closing appropriate port without leakage at maximum operating pressure. Upon energization of solenoid, the ball is moved by plunger and lever.

The air gap solenoid is of simple design and fully en capsulated.

The main features of the AC model are: Short response times, simple operation and no requirements for special contact protection.

Valve is available for two maximum operating pressures: 5000 PSI (LP = Low pressure) and 9000 PSI (HP = High pressure).



Size 3SE 10

Ordering Code

3SE 10 C XX/315 W120—60 N Z4 P V

- **SIZE**
  - 6 = 1/4"
  - 10 = 1/2" (ANSI D02)
- **FLOW PATTERN**
  - C = Normally closed
  - U = Normally open
- **DESIGN SERIES**
- **OPTIONS**
  - 315 = 5000 PSI
  - 630 = 9000 PSI
  - G + Voltage = DC
  - W + Voltage + Frequency = AC
  - Z4 = Plug in connector
  - Z5L = Plug in connector with indicator light
  - P = Check in pressure port
  - Omit = If not required
- MANUAL OVERRIDE
- **SEALS**
  - Omit = Buna-N
  - V = VITON

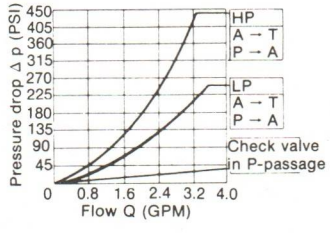
For size **3SE6**
Refer to **RA 22052** and **RA 22053**
For size **3SE10**
Refer to **RA 22086** and **RA 22087**

Technical Data

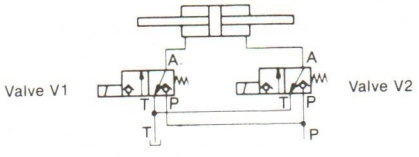
Hydraulic medium	Mineral oil		
Fluid temperature range	–25 to +160° F		
Viscosity range	35 to 1750 SSU		
AC voltage	120 V, 220 V-60 Hz; 24 V, 42 V, 110 V, 127 V, 220 V, 240 V-50 Hz;		
Max. operating pressure	port A	port P	port T
	up to 9000 PSI	up to 9000 PSI	up to 3000 PSI
Power requirement	50 VA	Max. coil temperature	+300° F
Duty Cycle	100%	Max. shifting frequency	7200/hour
Shifting time (on)	15 ms	Max. flow Q_{max}	4 GPM
Shifting time (off)	15 ms	Insulation	IP 65
Max. ambient temperature	+120° F		

appr. Weight 1.9 LBS

Performance Curve



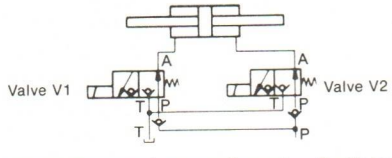
Example of Operation



4/3 (4/4)-way operation as per flow pattern J, with two 2-ball valves (type C).

V1/V2 neutral position:	both cylinder ends connected with tank line
V2 energized position:	piston travel to left
V1 energized position:	piston travel to right
V1/V2 energized position:	both cylinder ends connected with pressure line.

In this case when using a differential cylinder rapid approach in one direction is possible.



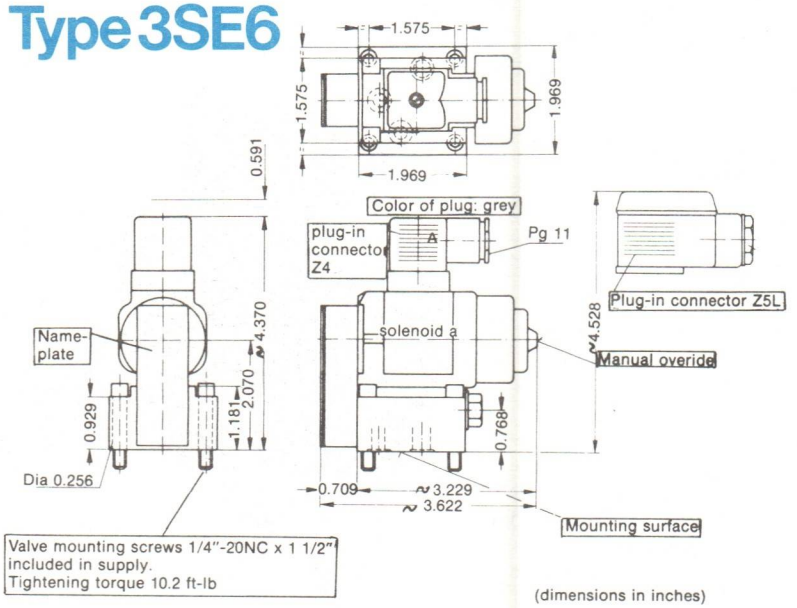
4/3 (4/4)-way operation as per flow pattern E, with two 1-ball valves (type U), with cartridge type check valve.

V1/V2 neutral position:	piston 'stop'. Hermetically locked against maladjustment.
V2 energized position:	piston travel to right
V1 energized position:	piston travel to left
V1/V2 energized position:	both cylinder ends connected with tank line.

Piston can be moved by external force (similar to flow pattern J).

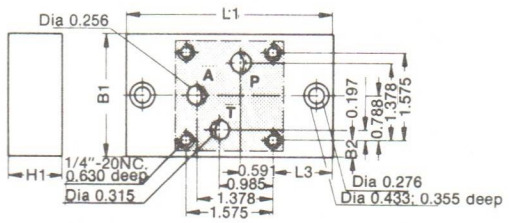
Unit Dimensions: Poppet Valve with AC solenoid

Type 3SE6

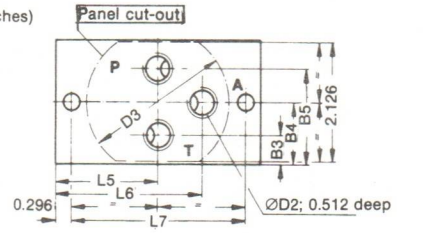


(dimensions in inches)

Unit Dimensions: Subplate



(dimensions in inches)



Subplate Type	B1	B2	B3	B4	B5	D2
G 270/5	2.205	0.315	0.512	1.103	1.693	1/4" NPT
G 273/5	3.150	0.788	0.689	1.575	2.461	3/8" NPT

D3	H1	L1	L3	L5	L6	L7
2.520	0.985	3.741	1.083	1.870	2.658	3.150
2.953	1.181	4.134	1.280	2.067	2.953	3.544

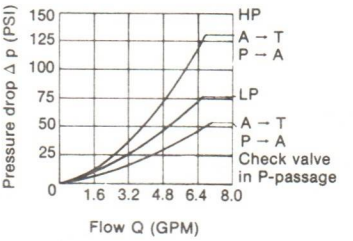
Technical Data

Type 3SE10

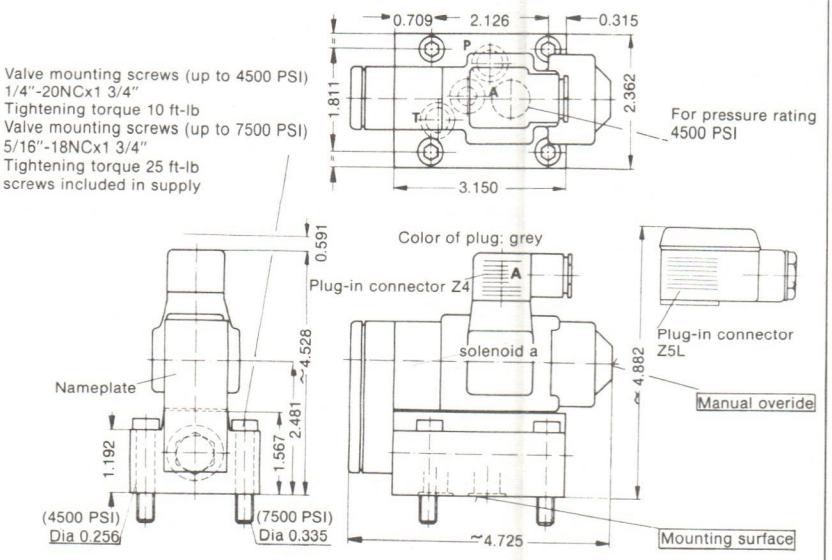
appr. Weight 4.8 LBS

Hydraulic medium	Mineral oil		
Fluid temperature range	-25 to 160° F		
Viscosity range	35 to 1750 SSU		
AC voltage	120 V; 220 Vw. 60 Hz; 24 V, 42 V, 110 V, 127 V, 220 V, 240 Vw. 50 Hz;		
Max. operating pressure	port A	port P	port T
	up to 9000 PSI	up to 9000 PSI	up to 1500 (100 bar)
Power requirement	60 VA	Max. coil temperature	+300° F
Duty Cycle	100%	Max. shifting frequency	7200/hour
Shifting time (on)	20 ms	Max. flow Qmax	9.5 GPM
Shifting time (off)	20 ms		
Max. ambient temperature	+120° F	Insulation	IP 65

For applications to other specifications please consult us.

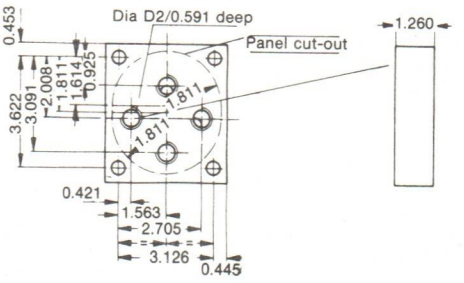


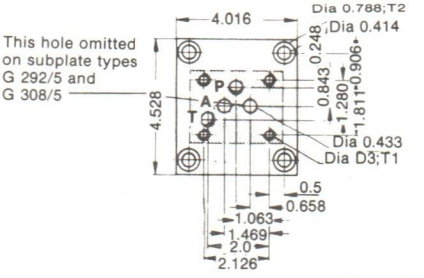
Unit Dimensions: Poppet Valve with AC Solenoid



(dimensions in inches)

Unit Dimensions: Subplate



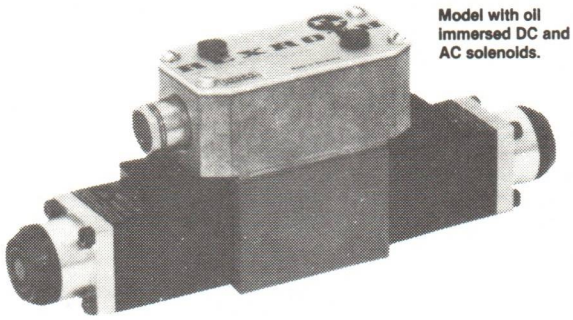


(dimensions in inches)

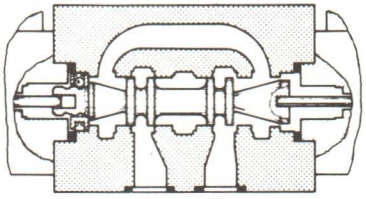
Subplate	D2	D3	T1	T2	for dir. valve	Pressure rating
G 66/5	3/8"NPT	1/4"-20NC	0.473	0.040	3/2	up to 4500
G 67/5	1/2"NPT	1/4"-20NC	0.473	0.040	3/2	up to 4500
G 292/5	1/2"NPT	5/16"-18NC	0.591	0.355	3/2	up to 7500
G 308/5	3/8"NPT	5/16"-18NC	0.591	0.355	3/2	up to 7500

Directional Control Valve

The main spool is held in the center or end positions by springs (except impulse valve). The spool is actuated by wet pin solenoids. A manual override button allows actuation of the spool without energization of the solenoids. The solenoid has a long working life and is fully encapsulated. The solenoid runs in oil, thus giving low wear, good heat dissipation and cushioned stop.
The AC solenoid has short response times, simple shifting and requires no special contact protection. The DC solenoid features high reliability, smooth shifting and is suitable for high frequencies.



Model with oil immersed DC and AC solenoids.



up to 5000 PSI 16 GPM D01 Mount

Size WE6-1/4"

Ordering Code

4 W E 6 C /OF A W220–50 N DL V/5

NO. OF WORKING PORTS
- 3 = 3 way
- 4 = 4 way

OPERATOR
- E = Solenoid
- H = Hydraulic pilot
- P = Pneumatic pilot (60–180 PSI)
- N = Pneumatic pilot (22–90 PSI)
- MM = Hand lever
- MR = Roller cam (horizontal)
- MD = Rotary knob

SIZE, 6(1/4") ANSI D01

SPOOL

RETURN OPERATOR
- Omit = Spring return
- F = Detents (manual only)
- O = No springs
- OF = No springs, w/detents

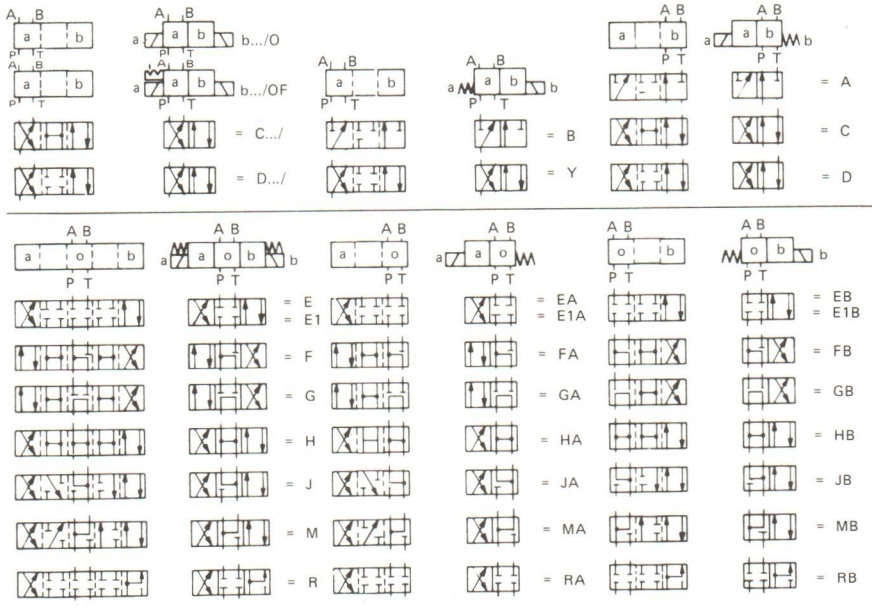
VOLTAGES
- Omit = 120 - 60 AC
- W + voltage + frequency for all other AC
- G + voltage for all DC

MANUAL OVERRIDE

ELECTRICAL CONNECTIONS
- D = Top electrical terminal box
- DL = Top electrical terminal box with indicator lights

SEALS
- Omit = Buna-N
- V = Viton

For **WE6,** refer to **RA 23177**
For **WMM6,** refer to **RA 22276**
For **WMR/WMU6,** refer to **RA 22274**
For **WH/WP6,** refer to **RA 22779**



Technical Data

Hydraulic medium	Mineral oil		
Fluid temperature range	– 20 to + 160° F		
Viscosity range	35 to 1750 SSU		
Max. operating pressure	Ports		
	A • B • P	T	
	5000 PSI	900 PSI	
Weight	Valve	Subplate G 341/1	Subplate G 342/1
	3.5 LBS	1.5 LBS	2.5 LBS
AC voltage	42 V; 110 V; 127 V; 220 V — 50 Cyc.		
	120 V; 220 V — 60 Cyc.		
DC voltage	12V; 24 V; 42 V; 60 V;		
	110 V; 180 V; 195 V; 220 V		

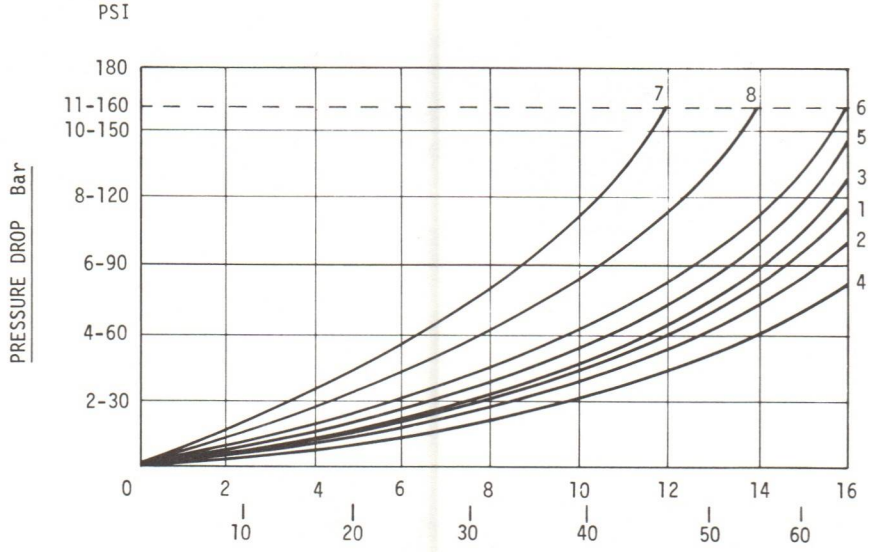
Voltage	DC	AC
Power requirement	26 W	—
Holding current	—	46 VA
In-rush current	—	130 VA
Duty cycle	100%	
Response time (on)	40 ms	25 ms
Response time (off)	20 ms	20 ms
Max. ambient temperature	120° F	
Max. coil temperature	300° F	
Max. shifting frequency	15000/hour	7200/hour

Performance Data, Applicable to all operators

PRESSURE vs. FLOW--Test fluid 172 SSU(36cSt.) at 120°F(50°C)

Curve #7 for "R" spool-ports A-B with Sol. b energized

Curve #8 for "G" spool-ports P-T when in spool center position



CURVE SELECTION CHART--

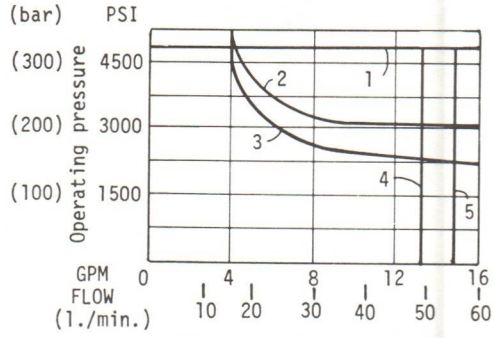
Spool type	Flow direction			
	P-A	P-B	A-T	B-T
	Curve Number			
A	3	3	-	-
B	3	3	-	-
C	1	1	3	1
D	5	5	3	3
E	3	3	1	1
F	2	3	3	5
G	5	3	6	6
H	2	4	2	2
J	1	1	2	1
M	2	4	3	3
R	5	5	4	-
Y	5	5	3	3

NOTE: The pressure drops at other viscosities can be estimated by allowing a 6% increase or decrease in the P for every 50 SSU deviation from the above chart.

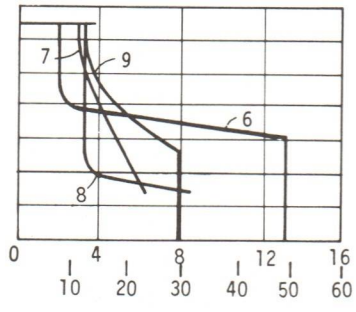
Performance Curves

VALVE PERFORMANCE DATA * (Without Malfunction).

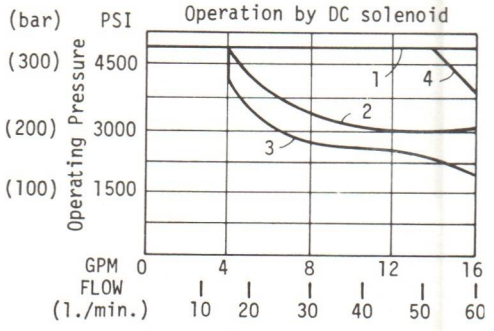
Operation by AC solenoid

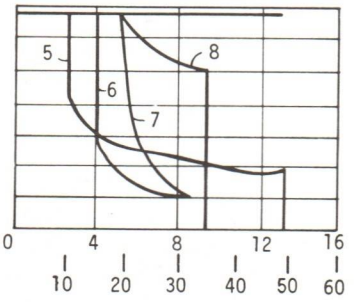


MAX. FLOW BY SPOOL TYPE WITHOUT MALFUNCTION



Operation by DC solenoid



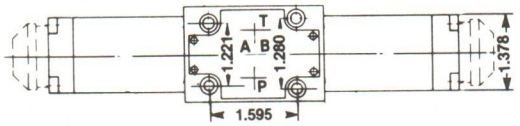


CURVE SELECTION CHART

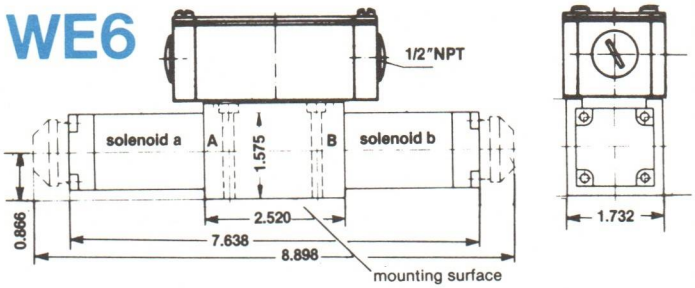
	Performance curve	Spool type
AC	1	E1,D/O C/O
	2	E
	3	J
	4	C,D,H,Y
	5	M
	6	A,B
	7	F
	9	G, ,R
DC	1	E1,D/O, C/O,M
	2	E
	3	J
	4	C,D,Y
	5	A,B
	6	
	7	F
	8	G, R
	9	H

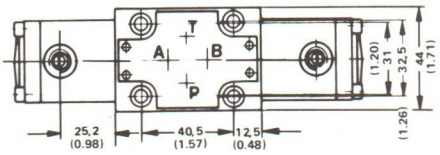
To maintain optimum efficiency and trouble free spool shifting, it is recommended to use a full flow filtration of 25 microns or less. This filtration will avoid silting in the flow passages which could limit the maximum flow capacity of the valve.

* Flow data as shown applies to two directional flows. If only one flow direction, as in the case when Port A or B is plugged, the flow is reduced from that as shown.

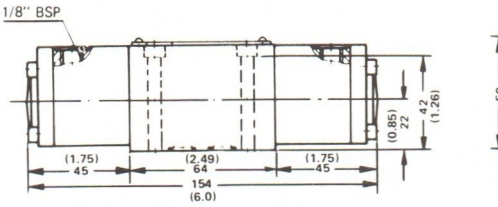


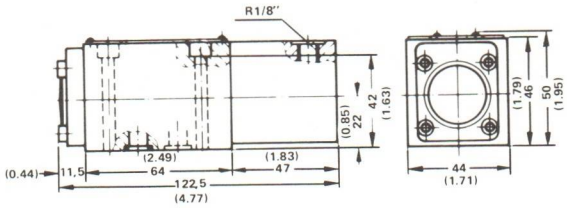
WE6

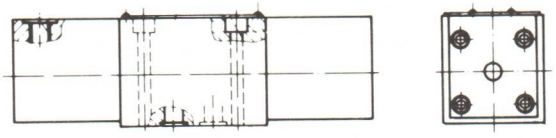


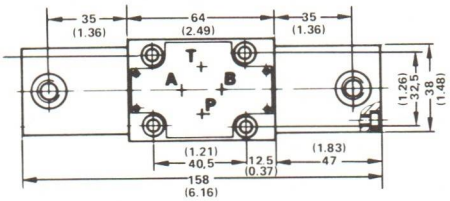


WH6

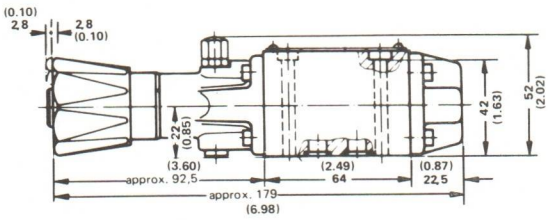


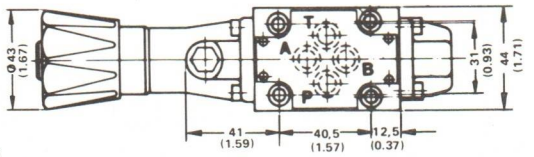


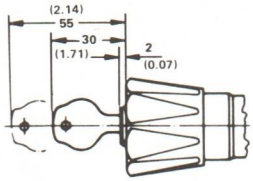




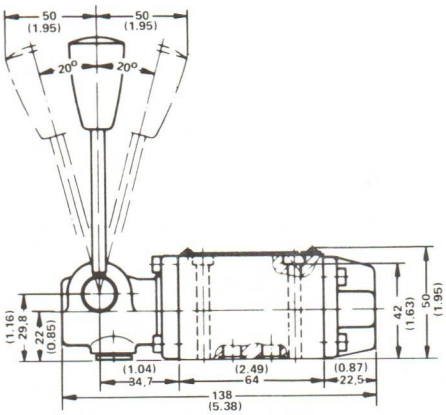
WP6

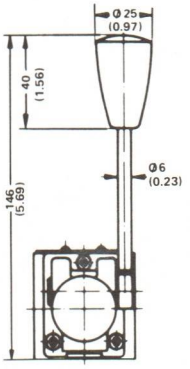


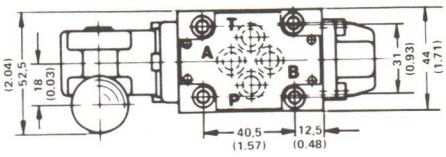




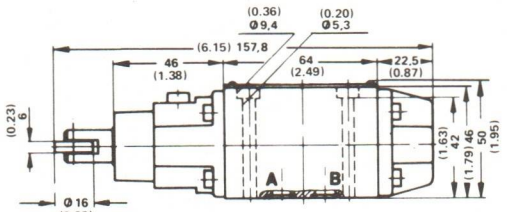
WMD6

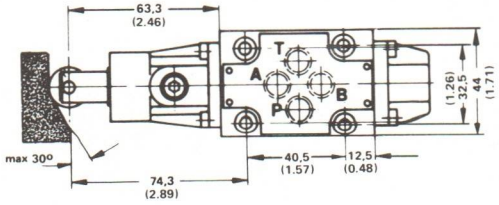


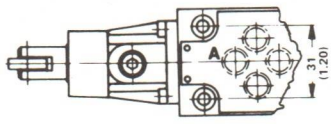




WMM6





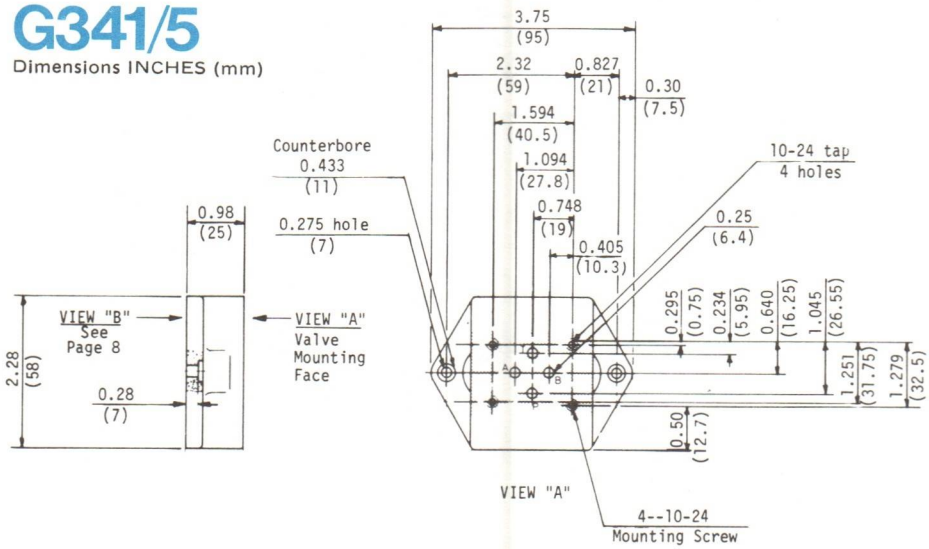


Roller Cam (Horizontal) **WMR6**

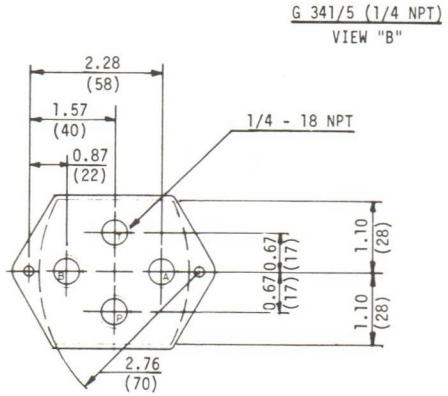
Roller Cam (Vertical) **WMU6**

G341/5

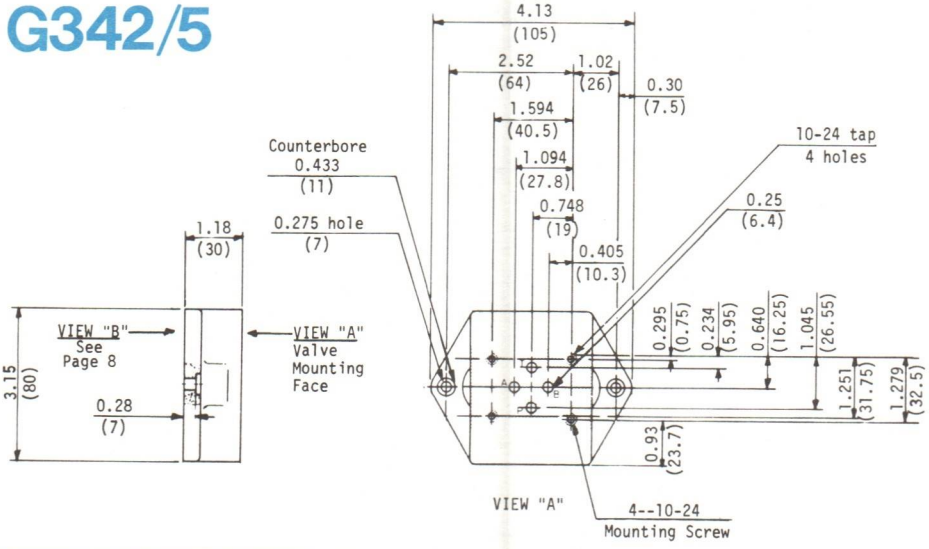
Dimensions INCHES (mm)

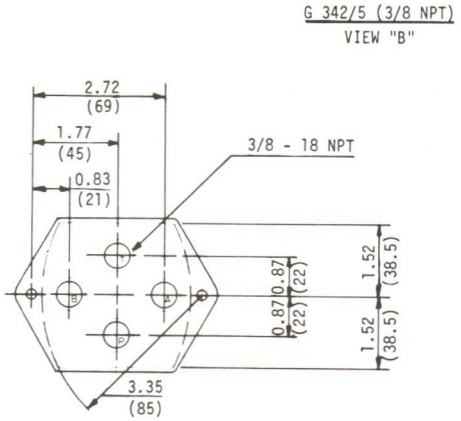


Dimensions INCHES (mm)

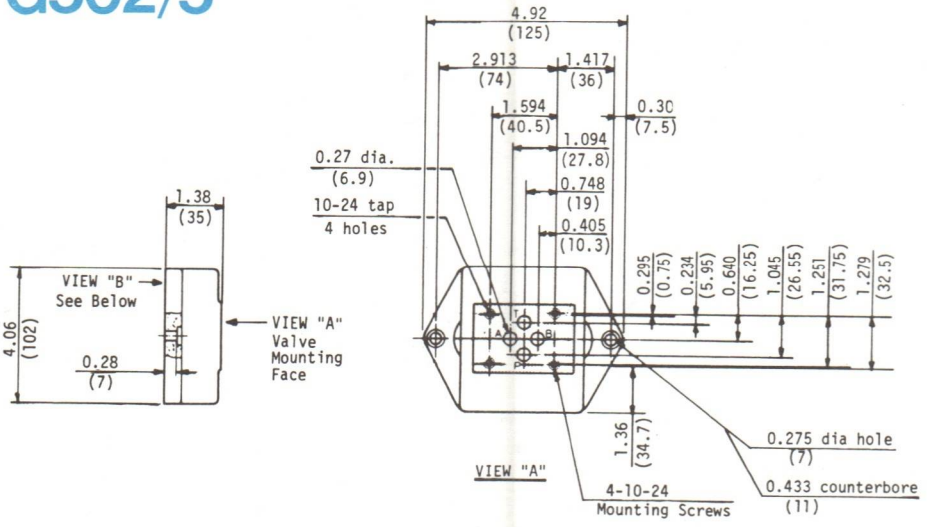


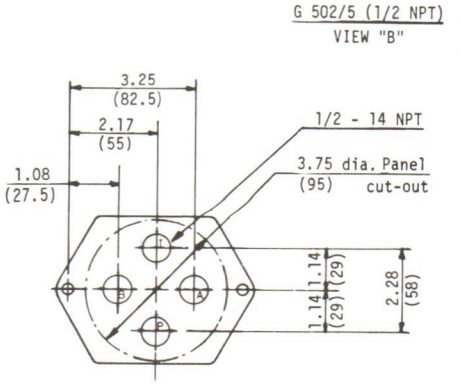
G342/5





G502/5





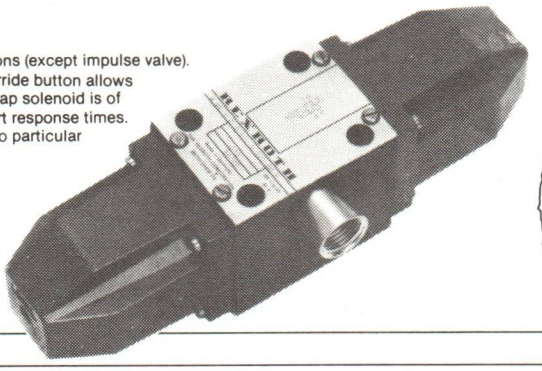
Directional Control Valve

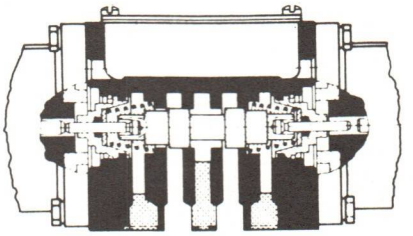
Model with Air Gap AC Solenoids

The main spool is spring returned to the center or end positions (except impulse valve). Spool operation is by means of air gap solenoids. Manual override button allows operation of the spool without solenoid energization. The air gap solenoid is of simple design, and fully encapsulated. The AC model has short response times. Important features are the simple operation and the fact that no particular protection is required.

up to 5000 PSI 26 GPM Mount DO2

Direct Solenoid Operated Valve and Subplate





Size WE10 · 1/2"

Ordering Code

4 W E 10 C XX/OF W220–50 N DL V/5

NO. OF WORKING PORTS
- 3 = 3 way
- 4 = 4 way

OPERATOR
- E = Solenoid
- H = Hydraulic pilot
- P = Pneumatic pilot (60 - 180 psi)
- N = Pneumatic pilot (22 - 90 psi)
- MM = Hand lever
- MR = Roller cam (horizontal)
- MU = Roller cam (vertical)
- MD = Rotary knob
- MDA = Rotary knob (with key lock)

SIZE, 10 (1/2")

SPOOL,

DESIGN SERIES
- 3x = Wet pin solenoid
- 4x = Air gap solenoid

RETURN OPERATOR
- Omit = Spring return
- F = Detents
- O = No springs
- OF = No springs, detents
- L = Air
- A = Oil

VOLTAGES
- Omit = 120-60 AC
- W + voltage + frequency for all AC
- G + voltage for all DC

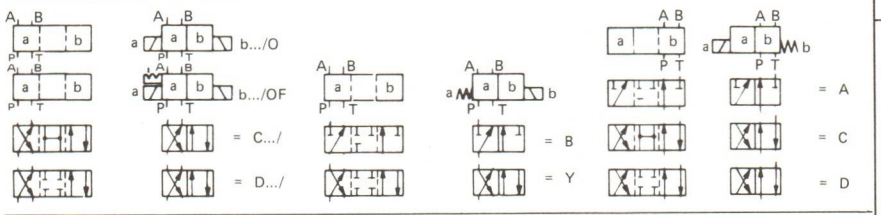
MANUAL OVERRIDE

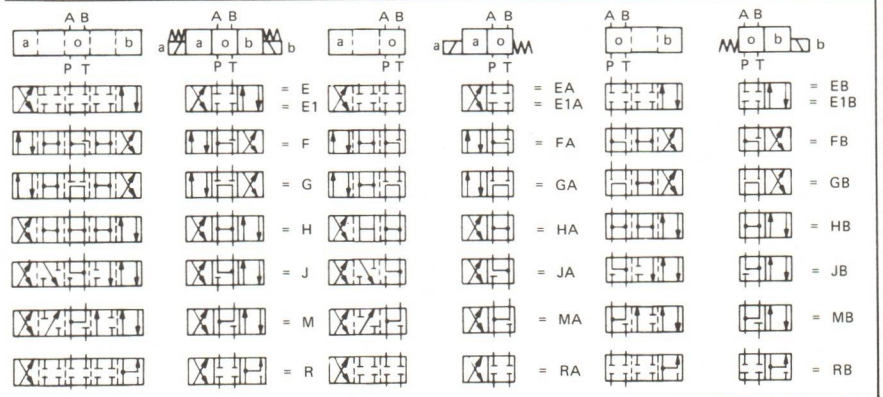
ELECTRICAL CONNECTORS
- D = Top electrical terminal box
- DL = Top electrical terminal box with indicator lights

SEALS
- Omit = Buna-n
- V = Viton

For **WE10**, refer to **RA 23196, RA 23197, RA 23299** and **RA 23300**
For **WMR10**, refer to **RA 22298**
For **WH10**, refer to **RA 22807**

For **WMM10**, refer to **RA 22300**
For **WMD10**, refer to **RA 22304**
For **WP10**, refer to **RA 22805**
For **WN10**, refer to **RA 22803**





Technical Data

Weight (valve)	with 2 solenoids 10.6 LBS: with 1 solenoid 8.4 LBS	
Hydraulic medium	Mineral oil	
Fluid temperature range	– 20 to + 160° F	
Viscosity range	35 to 1750 SSU	
Max. operating pressure		Ports
	A • B • P	T
	5000 PSI	2100 PSI
Throttling section in center position	spool type W	spool type Q
	3% of nominal section	6% of nominal section
Voltage rating	42 V; 110 V; 127 V; 220 V — 50 Hz 120 V and 220 V, 60 Hz	

Holding current	64 VA
In-rush current	430 VA
Duty cycle	100%
Response time (on)	20 ms
Response time (off)	20 ms
Max. ambient temperature	+ 120° F
Max. coil temperature	+ 300° F
Max. shifting frequency	7200/hour
Insulation	IP 65

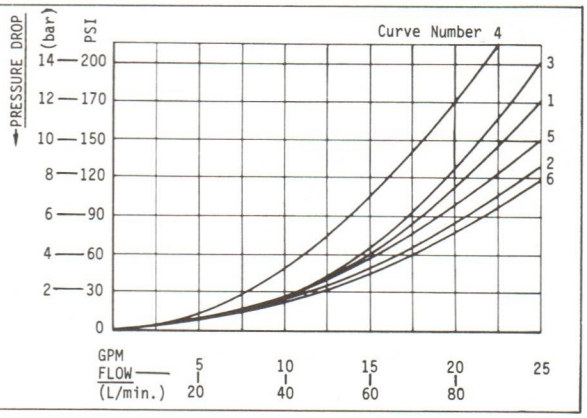
Due to silting the function of the valves is dependent on the filtration. In order to obtain the maximum flow values shown, main flow filtration of 25 µm is recommended. The internal flow forces in the valve also affect the flow, and therefore the flow details shown for 4-way valves apply for normal application with two flow directions (e.g. from P to A and simultaneously return flow from B to T). (See table).

If there is only one flow direction, e.g. when a 4-way valve with port A or B plugged is used as a 3-way valve, in extreme cases the maximum flow could be considerably lower.

Max performance data					
Flow (GPM) for spool types	at pressure (PSI) 750	1500	3000	3750	4500
C,D,E,H	26	26	26	24	21
F,G,R,	20	21	16	15	13
J,M	26	26	26	21	13
A,B	13	12	9	8	7
C/O,D/O	26	26	26	26	26

Curve #4 for "R" spool - ports A-B with Solenoid B energized

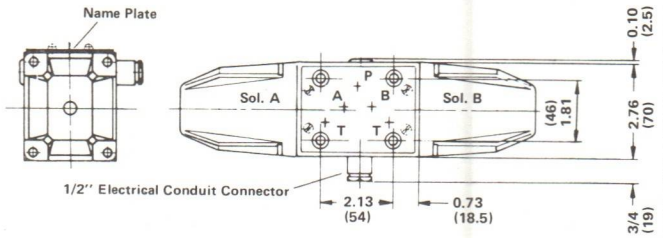
CURVE SELECTION CHART				
Spool Type	Flow Direction P - A	P - B	A - T	B - T
	Curve Number			
A	1	1		
B	1	1		
C	3	3	2	2
D	3	3	2	2
E	1	1	2	2
F	1	1	2	2
G	5	5	3	3
H	1	1	2	2
J	1	1	6	6
M	1	1	2	2
R	3	3	2	
Y	3	3	2	2

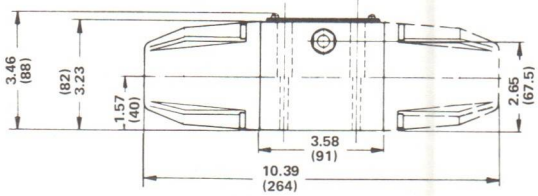


Curve #4 for "G" spool - ports P-T spool in center position

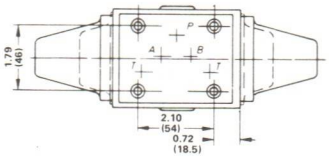
Dimensional Data

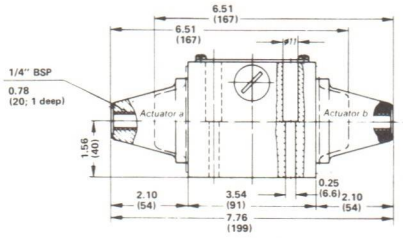
WE10



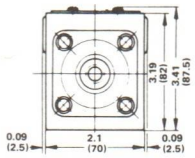


WH10

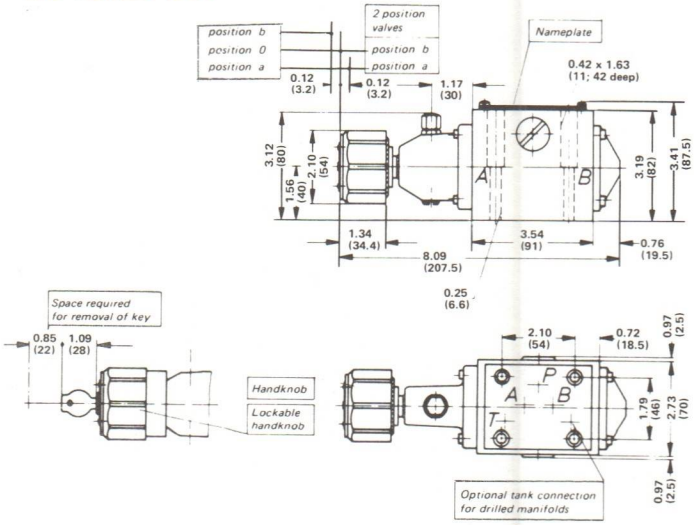




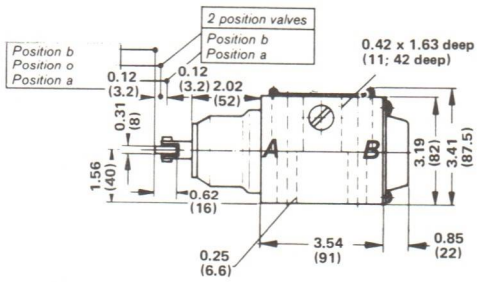
WP10

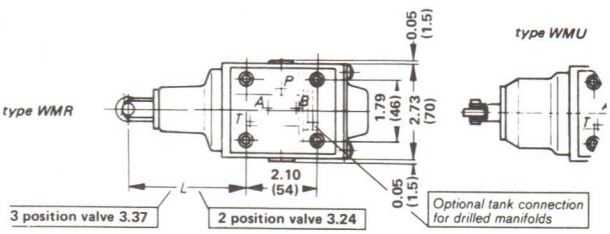


WMD10



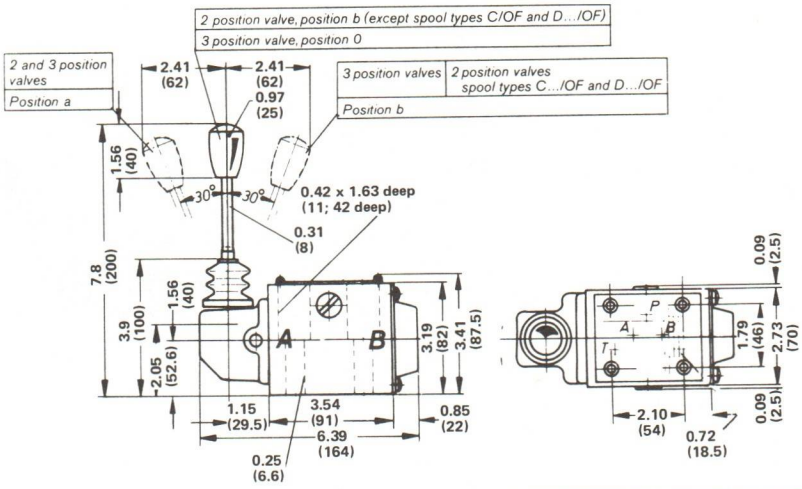
WMR

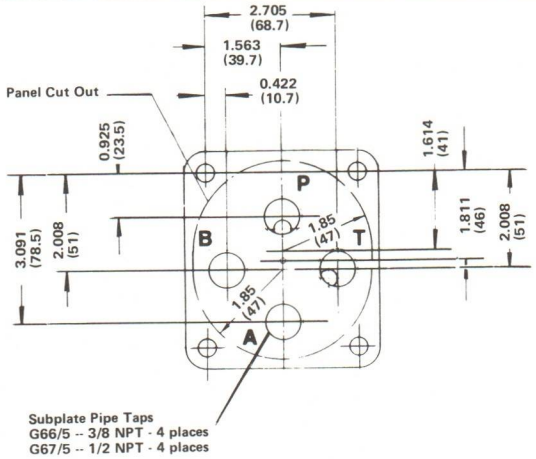




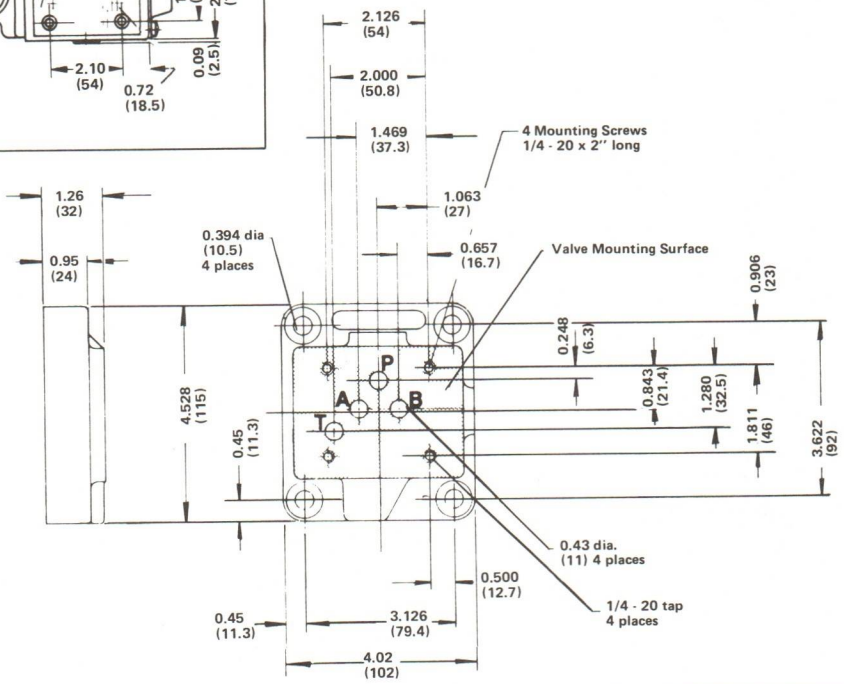
WMU10

WMM10

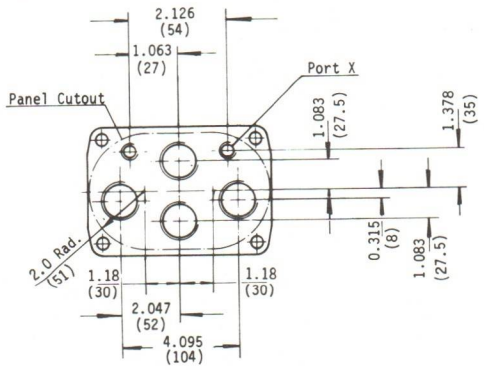




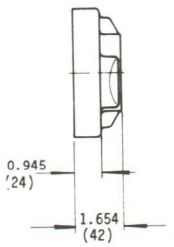
G66/5

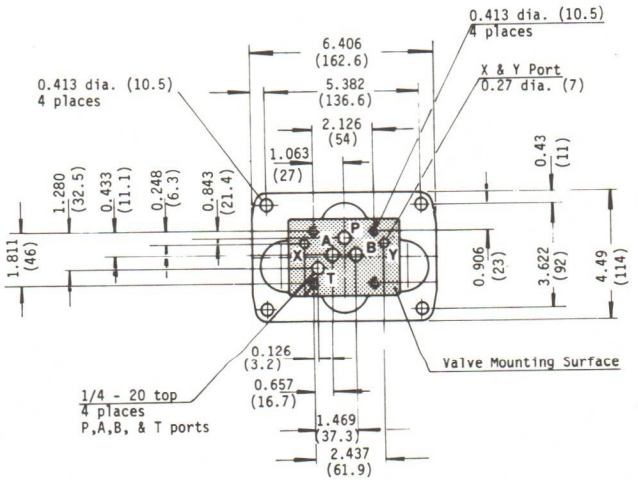


G535 3/4" NPT
G536 1"



Bolting to Subplate
4 - 1/4 - 20 x 1-3/4





Subplate Model No.	Ports A,B,P,T	Ports Y,X	Weight lbs. (Kg)
G535/5	3/4" NPT	1/2" NPT	8 (3.6)
G536/5	1" NPT	1/4" NPT	

Additional Subplates without Ports "X" or "Y"

3/8" and 1/2" NPT Ports -- See RA 23196

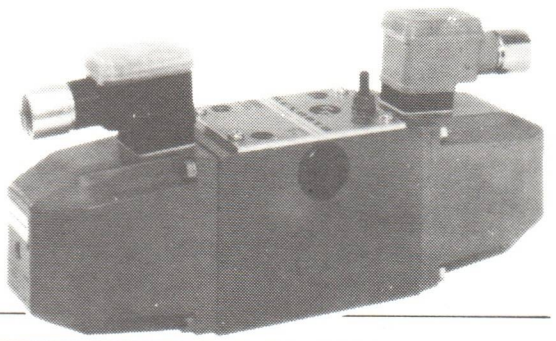
Directional Control Valve

The 5WE10 Direct Current, solenoid operated, 3 Way or 4 Way valve has a fifth chamber which connects the spool end hydraulic chambers together, thus permitting speed control of the spool shifting. This valve is available with D.C. solenoids only. Ordering code number "W110R" uses a 110V-A.C. built in rectifier, which is part of the solenoid plug assembly and requires ordering code "Z5" or "Z5L". The W110R operates on all frequencies.

The 5WE10 valve provides a means for the smooth reversal of the hydraulic system flow and is especially adapted to press applications.

Manual override allows the manual operation of the valve in the absence of electrical power. Indicator lights are an optional feature and are wired parallel to the solenoid to indicate presence of an electric signal.

up to 5000 PSI 26 GPM ANSI D02 Mount



5 Chamber Size 10 - 1/2" Refer to RA 23350

Ordering Code

5— 4 WE10 E XX/L OF W110R N Z5L B10 C V/5

5 CHAMBER
NUMBER OF WORKING PORTS
3 = 3 Way 4 = 4 Way

SPOOLS
DESIGN SERIES
AIR GAP
OMIT = For spring return
O = No springs
OF = No springs with detents

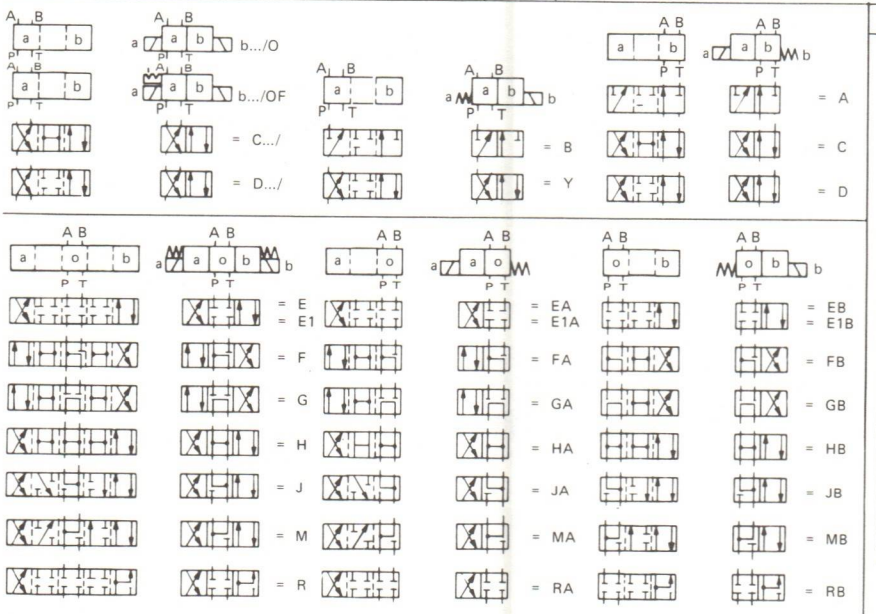
VOLTAGES
G + Voltage = DC
W110R = DC with 110 AC rectifier for all frequencies
Z5 or Z5L req. w/this option

MANUAL OVERRIDE
OMIT = Std. conduit connector
D = Top elec. terminal box
DL = Top elec. terminal box w/ indicator lights
Z = Small center plug in connector
Z4 = Small plug in connector
Z5 = Large plug in connector
Z5L = Large plug in connector w/indicator lights

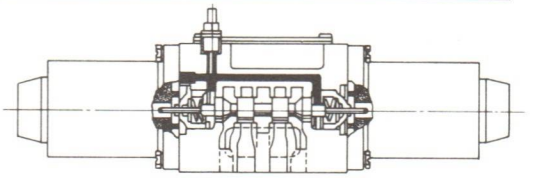
"P" PORT FIXED THROTTLE ORIFICE INSERT
OMIT = If not required
B08 = 0.032" (0.8mm)
B10 = 0.039" (1.0mm)
B11 = 0.043" (1.1mm)
B12 = 0.047" (1.2mm)
B15 = 0.059" (1.5mm)
B30 = 0.118" (3.0mm)

SPOOL SPEED CONTROL
OMIT = If not required
C = Adjust. orifice (used with electrical plug in connectors)
A06 = 0.024" (0.6mm)
A07 = 0.028" (0.7mm)
A08 = 0.032" (0.8mm)
A10 = 0.039" (1.0mm)
A12 = 0.047" (1.2mm)

SEALS
OMIT = Buna-N
V = VITON



Technical Data



Pressure Rating		*A & B ports 5000 psi (340 bar) T port 2300 psi (160 bar)
Response Time (without speed control)		Energized, 60 ms De-energized, 40 ms
Maximum Flow		26 GPM (100 l./min)
Solenoid Operator		12 or 24 VDC standard, 42, 60, 96, 110, 180, 195 & 220, optional 110 VAC rectified for 96 VDC solenoid
Power Consumption		41 watts
Operating Temperature		120°F (+50°C) to 300°F (+150°C)
Fluid Operating Temperature (normal operating conditions)		22°F (-20°C) to 160°F (+70°C)
Viscosity Range		35 SSU (2.8cSt) to 1750 SSU (380cSt)
Valve Cycles Per Hour		15,000
Weight	w/one solenoid	11.4 lbs (5.2 kg)
	w/two solenoids	14.5 lbs (6.6 kg)
	Subplate, 3/8 & 1/2 NPT	5.1 lbs (2.3 kg)
	Subplate, 3/4 NPT	6.1 lbs (2.7 kg)

*For spools A & B, port "T" must be connected to the drain when operating pressure exceeds 2300 psi (160 bar)

Performance Curves (pressure drop Δ p related to flow Q at 172 SSU)

Due to silting the function of the valves is dependent on the filtration. In order to obtain the maximum flow values shown, main flow filtration of 25 µm is recommended. The internal flow forces in the valve also affect the flow, and therefore the flow details shown for 4-way valves apply for normal application with two flow directions (e.g. from P to A and simultaneously return flow from B to T). (See table).

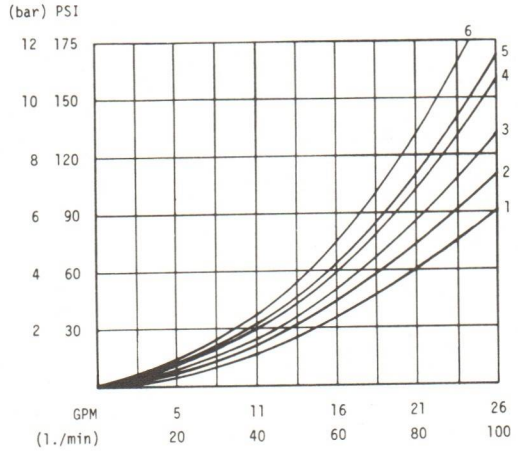
If there is only one flow direction, e.g. when a 4-way valve with port A or B plugged is used as a 3-way valve, in extreme cases the maximum flow could be considerably lower.

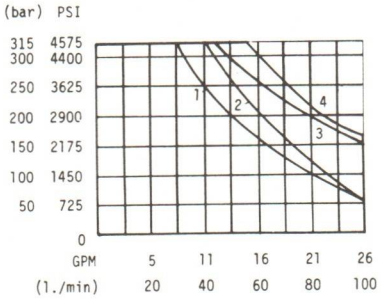
CURVE NO.	SPOOL
1	A, B, V
2	F, P
3	J
4	W
5	G
6	C
7	D, Y
8	E, H, M

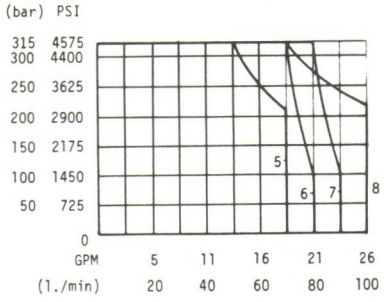
CURVE SELECTION CHART

SPOOL TYPE	FLOW DIRECTION P-A	P-B	A-T	B-T
A, B	2	2	—	—
C	2	2	3	3
D	2	2	3	4
E	1	1	2	2
F	1	2	2	2
G	4	4	5	6
H	1	1	3	4
J	2	2	1	2
M	1	1	2	3
R	2	5	2	—
		B-T	A-T	P-T
Center Position F	—	—	1	3
Center Position G	—	—	—	4
Center Position H	—	—	—	1
	P-A	B-A	A-T	P-T
Energized R	—	4	—	—

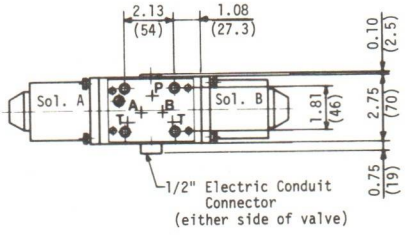
Flow based on pressure tests made with warm oil and the solenoid voltage 10% below rating. Tests performance to 4500 PSI.

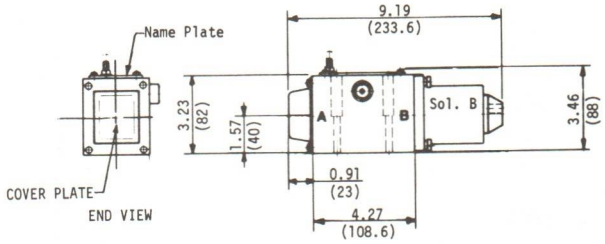


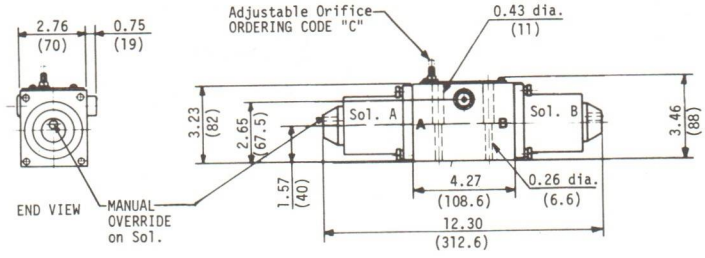


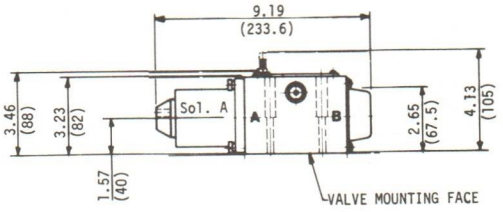


Dimensional Data

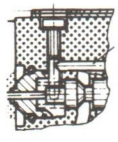






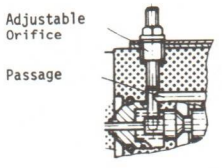


SPOOL SPEED CONTROL OPTIONS (for control through the fifth chamber)



ORDERING CODE "omit" for standard passage

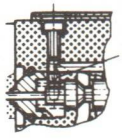
The standard "fifth chamber" passage permits maximum speed of the spool shifting and provides for a smooth change in the reversal of oil flow.



OPTIONAL FEATURE--ADJUSTABLE ORIFICE
ORDERING CODE "C"

The adjustable orifice provides a means to adjust the spool shifting speed to suit the requirements of the hydraulic system.

The adjustable orifice is adjusted by the use of a slotted screw and a locking nut. Electrical plugs on the solenoids must be used in place of the valve top terminal box.

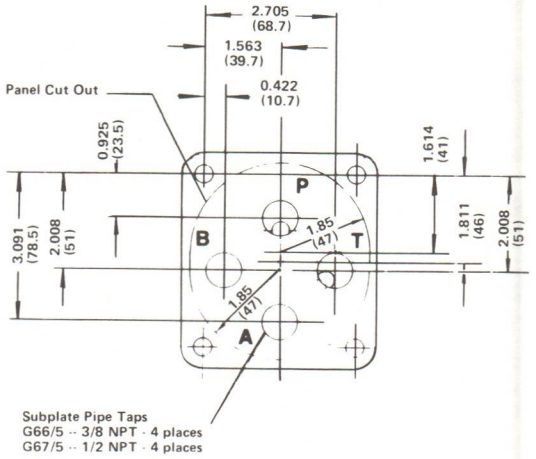


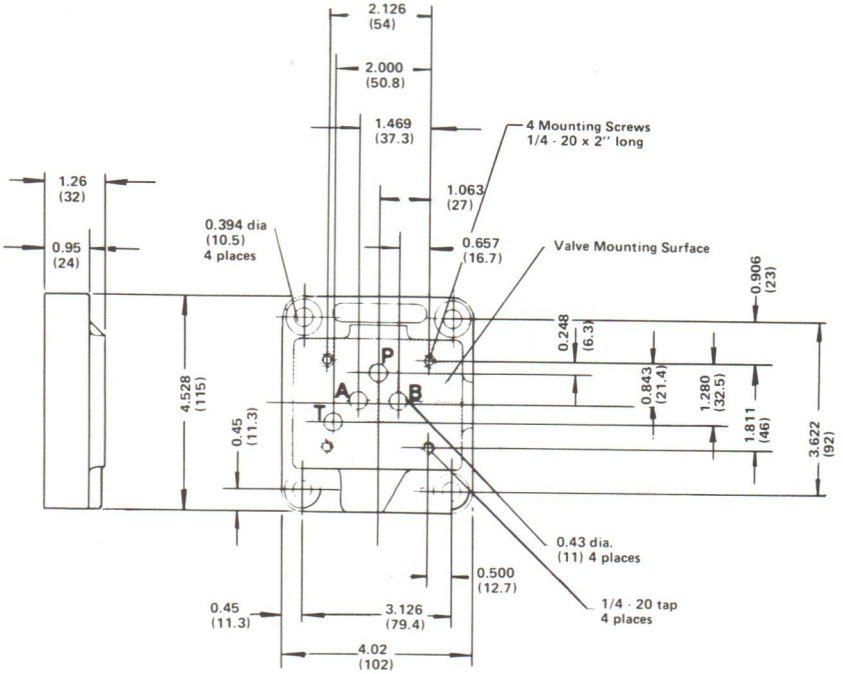
OPTIONAL FEATURE--FIXED ORIFICE
ORDERING CODE "A"

Six fixed orifices are available and are ordered for installation by the factory at the time of the valve assembly.

Orifices are manufactured with orifice holes 0.032, 0.039, 0.043, 0.047, 0.059, 0.118 inch dia.

G66/5

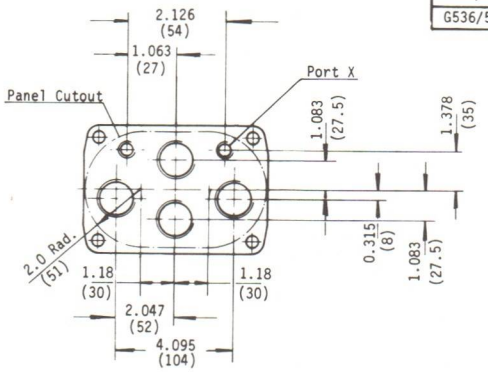


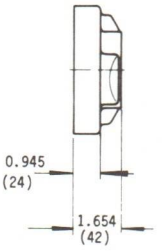


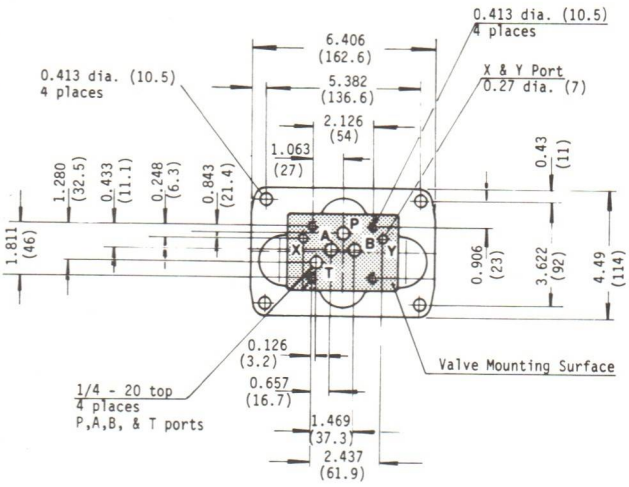
G535 3/4" NPT
G536 1"

Bolting to Subplate
4 - 1/4 - 20 x 1-3/4

Subplate Model No.	Ports A,B,P,T	Ports Y,X	Weight lbs. (Kg)
G535/5	3/4" NPT	1/2" NPT	8 (3.6)
G536/5	1" NPT	1/4" NPT	

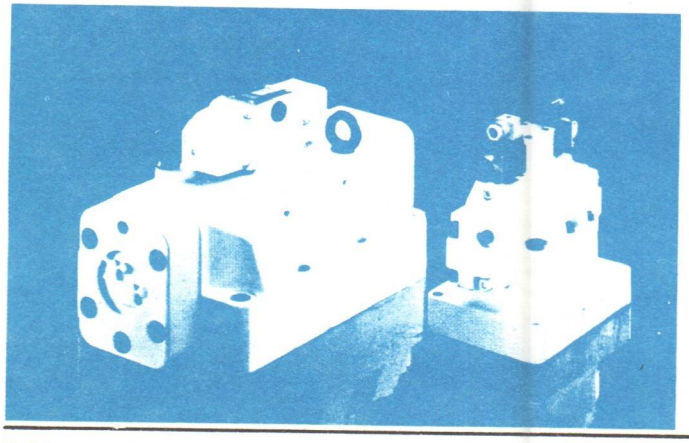


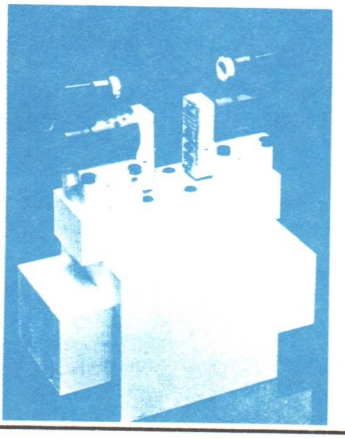


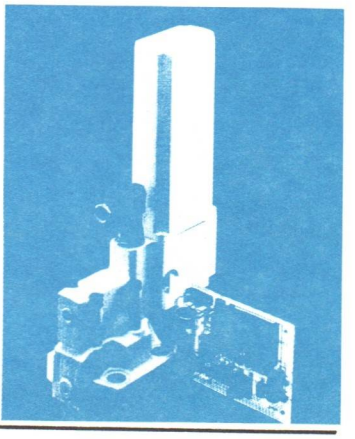


Additional Subplates without Ports "X" or "Y"

3/8" and 1/2" NPT Ports -- See RA 23196



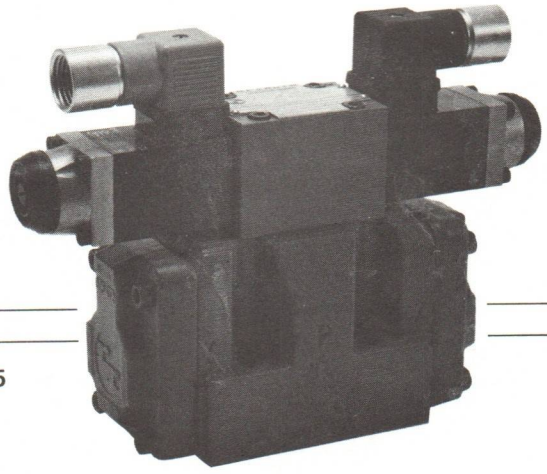




DirectionalControlValve

The 4WEH10 valve, in the Design-Series 20, is a solenoid controlled pilot operated hydraulic 4-way valve for high flow (up to 43 GPM - 160 l/min.) and pressures to 5000 PSI (340 bar). This valve is sub-plate mounted. Subplates are available for 1/2, 3/4, or 1" NPT. Piloting of this valve is with a REXROTH 4WE6 valve. The 4WE6 valve is fully described on RA 23177 and has solenoids of the WET PIN design to assure long service life. The REXROTH Size 6 pilot valves to include...hand (either lever or rotary operated), or air pilot valves can be ordered in place of the solenoid operator.

Internal or External piloting and Internal or External drain of the pilot section is available. This can be field changed by the use or the removal of plugs which are located under the pilot valve for easy access. For internal pilot flow, when the pilot flow exceeds the allowable flow of the WE6 valve, one of four orifices are available. These orifices reduce the pilot oil flow to a safe operating rate. A pressure reducing sandwich valve is available for use when the main valve operates at full pressure and exceeds the allowable pilot valve operating pressure.



SizeWEH10 · 1/2" Refer to RA 24750

43 GPM 5000 PSI ANSI D02

Ordering Code

4 WEH 10 H C XX/OF 6AW220 N SD1 10 V/5

NUMBER OF WORKING PORTS
3 = 3 way 4 = 4 way

OPERATOR
EH = Sol. controlled hydraulic pilot
H = Hydraulic pilot operated

SIZE
10 = 1/2" (ANSI DO2)

RETURN
H = Hydraulic Omit = Spring return

SPOOL

DESIGN SERIES
Omit = Subplate

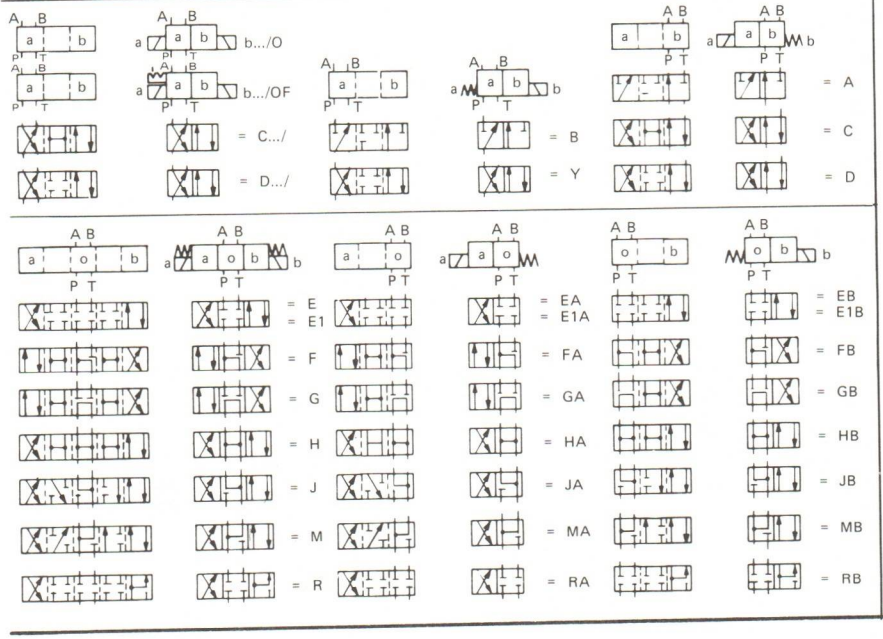
SPRING
Omit = Spring assist not req'd.
O = No spring, no detent
OF = No spring, with detents

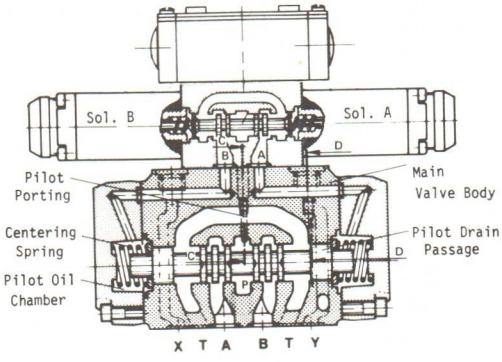
OPTIONS

Omit	=	Without pilot valve (WH only)
6A	=	Size 6 pilot, wet pin (WEH 10, 16 & 20 only)
G + volt	=	DC (WEH only)
W + volt + HZ	=	AC (all except 120-60, omit) WEH only
E	=	Int. pilot - ext. drain
ET	=	Int. pilot - int. drain
T	=	Ext. pilot - int. drain
Omit	=	Ext. pilot - ext. drain
S	=	Pilot choke - meter in
S/D1	=	Pilot choke, meter in w/D1 press. reducing
D1	=	Pilot pressure reducing valve (1:0.66 reduction)
D	=	Top electrical box
DL	=	Top electrical box w/ind. lights

ADDITIONAL SPECIAL FEATURES
Are available to include; stroke limiter, limit switches, throttle orifices (0.031 to 0.118" dia) and pilot pressure insert (63 psi cracking pressure), consult factory.

SEALS
Omit = Buna-N
V = Viton





Technical Data

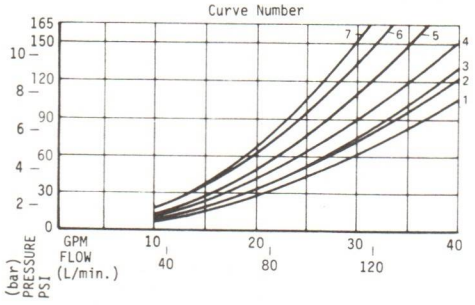
Pressure Rating	P, A, B ports	5000 PSI (315 bar)
	T port, w/ext. drain	5000 PSI (315 bar)
	T port, w/int. drain	2300 PSI (160 bar) DC sol.
	T port, w/int. drain	1500 PSI (100 bar) AC sol.
	Y port, w/ext. drain	2300 PSI (160 bar) DC sol.
	Y port, w/ext. drain	1500 PSI (100 bar) AC sol.
Pilot Pressure, Max.		4000 PSI (280 bar)
Min.		3 position valve, w/ext. pilot, 150 PSI (10 bar)
Min.		2 position, spring offset, w/ext. pilot, 150 PSI (10 bar)
Min.		2 position, hyd. return, w/int. pilot, 100 PSI (7 bar)
Fluid Operating Temperature		-22°F (-30°C) to +160°F (70°C)
Viscosity Range		35 SSU (2.8cSt.) to 1750 SSU (380cSt.)
Maximum Flow*		3000 PSI (70 bar) 43 GPM (160 l/min)
		3600 PSI (140 bar) 40 to 43 GPM (150 to 160 l/min)
		5000 PSI (210 bar) 32 to 43 GPM (120 to 160 l/min)
		*varies with spool selection
Weight (with subplate)		With 1 solenoid, 5.2 lbs. (11.5 kg)
		With 2 solenoids, 5.4 lbs. (11.9 kg)

Response Time For Spool Shift*

Time to shift spool from center or zero to end position -- time in "ms"								
PILOT PRESSURE PSI (bar)	1000 (70)		2000 (140)		3000 (210)		4000 (280)	
SOLENOID OPERATOR	AC	DC	AC	DC	AC	DC	AC	DC
3 position valve - spring centered ms	30	65	25	60	20	55	15	50
2 position valve - ms	35	80	30	75	25	70	20	65
TIME TO SHIFT SPOOL from end to center or zero position -- time in "ms"								
3 position valve - spring centered ms	30							
2 position valve - ms	35	40	30	35	25	30	20	25

* Internal hydraulic forces within the valve will affect the flow. The tables and charts are based on two directional flow. Two directional flow, for example, is flow from P to A and from B to T simultaneously.

Pressure Drop, Varied Flow, Fluid at (175 SSU, 37cSt.)



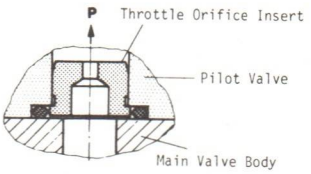
Curve number for VALVE SPOOL in SHIFTED POSITION

Spool Type	Direction of flow P-A	P-B	A-T	B-T
E	1	2	4	5
F	1	4	1	4
G	4	2	2	6
H	4	4	1	4
J	1	2	1	3
M	4	4	3	4
R	2	3	3	5

Spool Type	Direction of flow A→T	B→T	P→T
F	3	–	6
G	–	–	7
H	1	3	5

Curve number for VALVE SPOOL in center (zero) position ▶

Throttle Orifice Insert Option

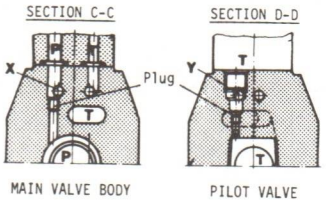


The THROTTLE ORIFICE INSERT is used to reduce the pilot oil supply flow to the pressure port P of the WE6 pilot valve.

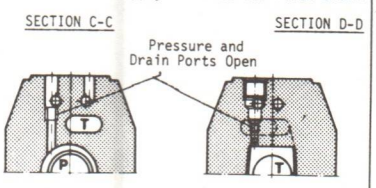
As an example, this THROTTLE ORIFICE INSERT is used when the flow to the pilot valve exceeds the normal allowable flow through the pilot valve. This orifice should be used when a system accumulator is in the circuit ahead of the pressure port of the main valve and the pilot valve fluid supply is internal.

Main Valve Pilot Pressure and Drain

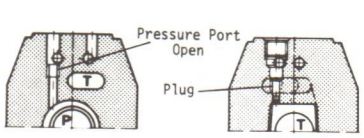
ORDERING CODE "omit"
External Pilot Supply and External Pilot Drain



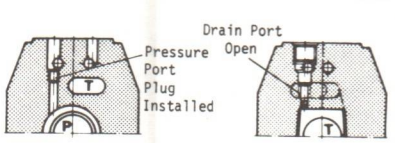
ORDERING CODE "ET"
Internal Pilot Supply and Internal Pilot Drain



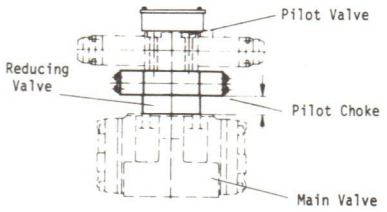
ORDERING CODE "E"
Internal Pilot Supply and External Pilot Drain



ORDERING CODE "T"
External Pilot Supply and Internal Pilot Drain



Pilot Pressure Reducing Valve



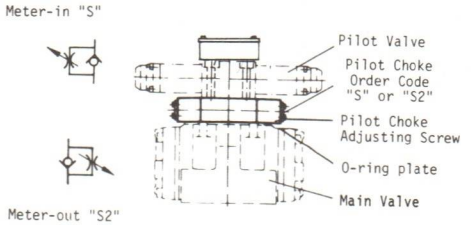
The PILOT PRESSURE REDUCING VALVE is supplied as an OPTIONAL FEATURE, Ordering Code D1.

The D1 reducing valve is used to reduce the pilot oil pressure for the piloting of the main valve spool.

USE . . . when piloting of the valve is internal and the system pressure exceeds 3500 PSI (240 bar).

This is a fixed pressure reducing valve to reduce the pressure to a ratio of 1 to 0.66.

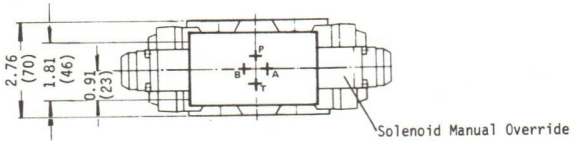
Pilot Valve Choke, Meter-in/Meter-out

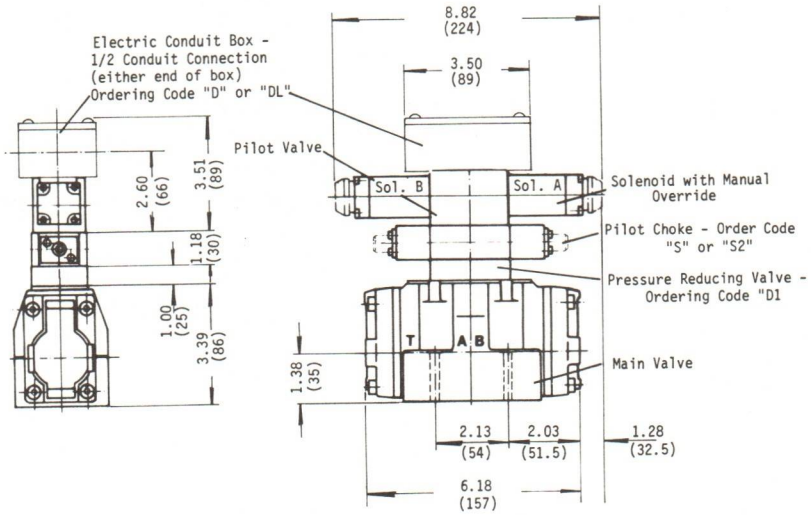


SizeWEH10 · 1/2"

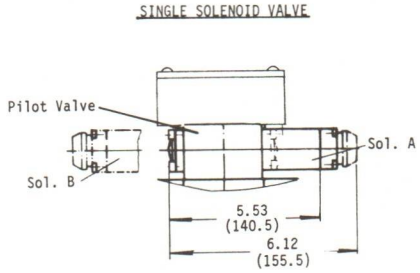
Inches
(mm)

DOUBLE SOLENOID VALVE

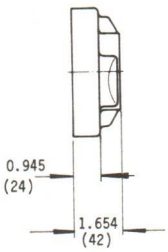


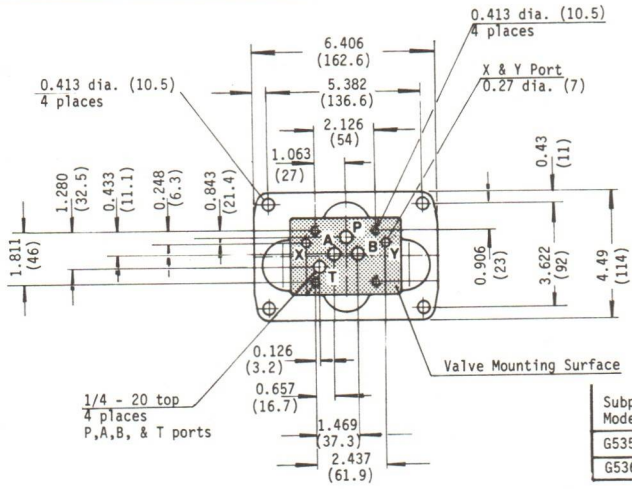


SINGLE SOLENOID VALVE



G535 3/4" NPT
G536 1"



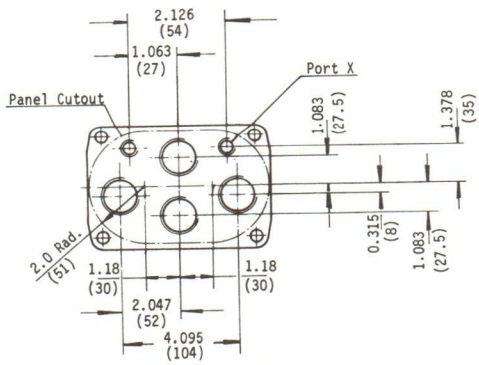


Bolting to Subplate
4 - 1/4 - 20 x 1-3/4

Subplate Model No.	Ports A,B,P,T	Ports Y,X	Weight lbs. (Kg)
G535/5	3/4" NPT	1/2" NPT	8 (3.6)
G536/5	1" NPT	1/4" NPT	

G535/&G536/5

Pipe Connections- Subplate G535/5 and G536/5



Additional Subplates without Ports "X" or "Y"

3/8" and 1/2" NPT Ports -- See RA 23196

DirectionalControlValve

The size 16 (3/4") valve is available with AC/DC solenoid operator (WE), direct hydraulic pilot (WH), or direct-acting hand lever.

HYDRAULIC PILOT OPERATOR (WH)

Operation of the main spool is by means of direct application of hydraulic pressure.

HAND LEVER OPERATOR (WMM)

The hand lever operates via a pivot pin to apply direct mechanical pressure for spool shifting. The lever mechanism is fully encapsulated within a removeable valve head. The valve head mechanism can be interchanged without dismantling the valve.

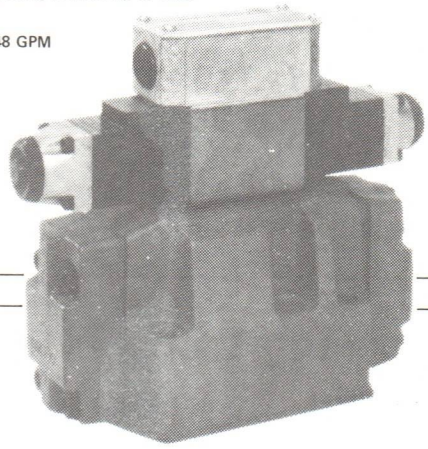
SOLENOID OPERATOR (WE)

Operation of the main spool is by means of pilot valve, available with either DC or AC wet pin solenoids. Manual override on the pilot valve solenoids allows operation of the main spool without energization of the solenoids, provided pilot pressure is available. The main valve spool is held in the center or end positions by springs of hydraulic pressure.

The pilot oil supply and drain can be provided internally or externally.

The directional control valves size 16 are available for an operating pressure up to 5000 PSI.

Up to 5000 PSI 48 GPM
D04 Mount



SizeWEH16-3/4" Refer to RA 22825 and RA 24757

Ordering Code

4 WEH 16 H C XX/OF 6AW220 N SD1 10 V/5

NUMBER OF WORKING PORTS
3 = 3 way 4 = 4 way

OPERATOR
EH = Sol. controlled hydraulic pilot
H = Hydraulic pilot operated
MM = Hand lever

SIZE
16 = 3/4" (ANSI D04)

RETURN
H = Hydraulic Omit = Spring return

SPOOL

DESIGN SERIES
Omit = Subplate

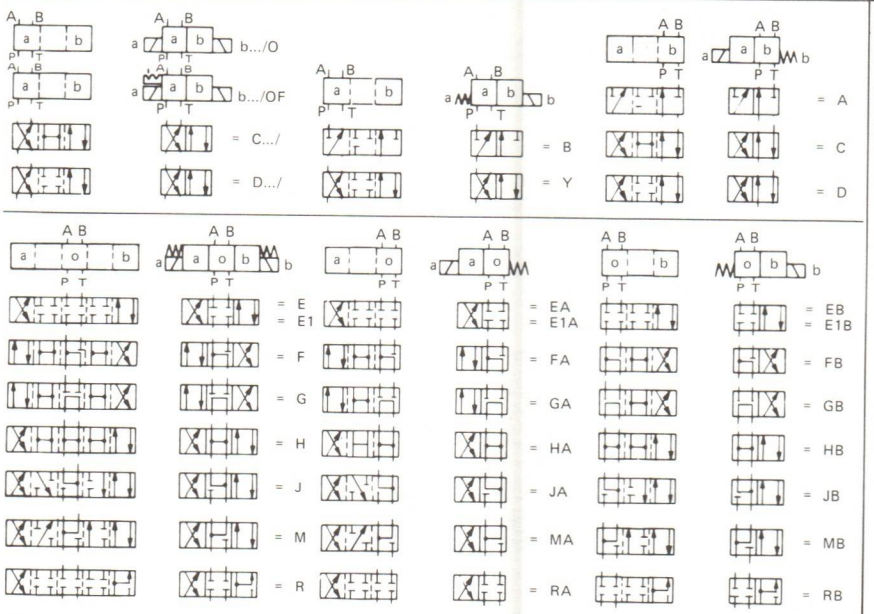
SPRING
Omit = Spring assist not req'd.
O = No spring, no detent
OF = No spring, with detents

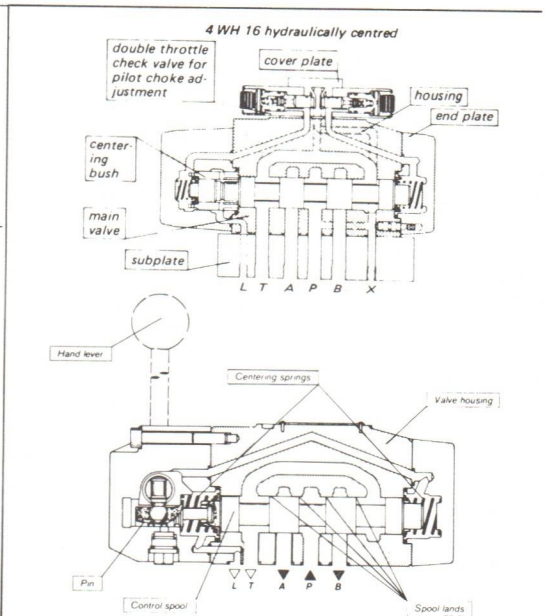
OPTIONS

Omit	=	Without pilot valve (WH only)
6A	=	Size 6 pilot, wet pin (WEH 10, 16 & 20 only)
G + volt	=	DC (WEH only)
W + volt + HZ	=	AC (all except 120-60, omit) WEH only
E	=	Int. pilot - ext. drain
ET	=	Int. pilot - int. drain
T	=	Ext. pilot - int. drain
Omit	=	Ext. pilot - ext. drain
S	=	Pilot choke - meter in
S/D1	=	Pilot choke, meter in w/D1 press. reducing
D1	=	Pilot pressure reducing valve (1:0.66 reduction)
D	=	Top electrical box
DL	=	Top electrical box w/ind. lights

ADDITIONAL SPECIAL FEATURES
Are available to include; stroke limiter, limit switches, throttle orifices (0.031 to 0.118" dia) and pilot pressure insert (63 psi cracking pressure), consult factory.

SEALS
Omit = Buna-N
V = Viton





Weight (valve)		with 2 solenoids 19 LBS; with 1 solenoid 18 LBS
Hydraulic medium		Mineral oil
Viscosity range		35 to 1750 SSU
Fluid temperature range		– 20 to + 160° F
Max. operating pressure		Valve type H — 4 WEH 16 ...
Ports P • A • B		5000 PSI
Port T	Pilot drain Y = external	3500 PSI
		900 PSI
Min. pilot pressure		p_{st}= 150 PSI
Max. pilot pressure	3500 PSI	

Total response time of valve from zero into end position (with AC voltage)			
at pilot pressure p_{st}	700 PSI	2100 PSI	3500 PSI
3-position valves, spring centered	30 ms	25 ms	20 ms
2-position valves	35 ms	30 ms	25 ms
Total response time of valve from end into zero position			
3-position valves, spring centered	40 ms		
2-position valves	35 ms	30 ms	25 ms

AC voltage	42 V; 110 V; 127 V; 220 V, 50 Cyc. 120 V and 220 V, 60 Cyc.
DC voltage	12; 24; 42; 60; 110; 180; 195 and 220 V
Duty Cycle	100%
Max. ambient temperature	+ 120° F
Max. coil temperature	+ 300° F

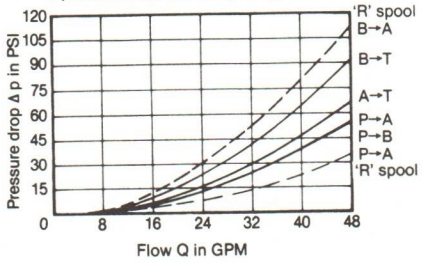
Voltage	DC	AC
Power requirement	26 W	—
Holding current	—	46 VA
In-rush current	—	130 VA

The total response times from zero into end position increases by 20 ms for DC voltage.

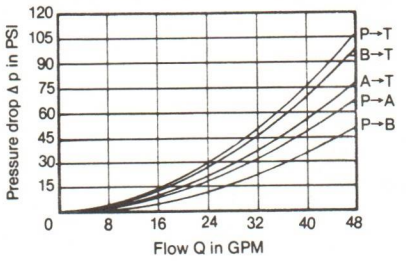
For applications to other specifications please consult us.

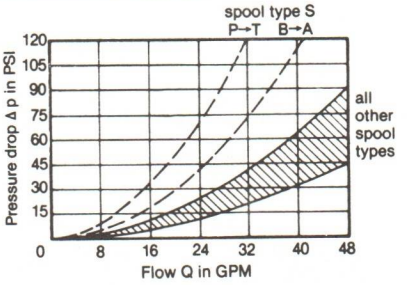
Performance Curves (drop Δ p related to flow Q at 170 SSU)

Δ p-Q-characteristic for spool types E and R



Δ p-Q-characteristic for spool types G



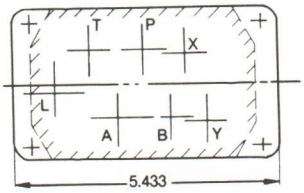


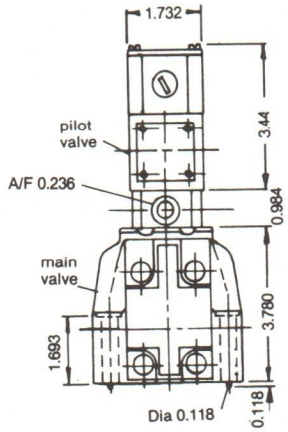
Max. performance data	2-position valves, spring offset 3-position valves, spring centered					Pilot pressure insert required when X = internal for
Flow (GPM) for spool types	at pressure (PSI) of 1000	2000	3000	4000	5000	
E, J, M, Q, R, C, D	64	64	54	48	45	C, up to approx. 29 GPM
F	53	38	30	26	24	F
G, H	58	42	34	29	26	G, H

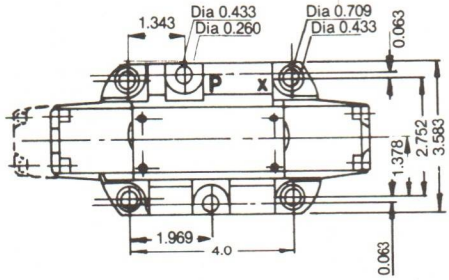
Due to silting,the function of the valves is dependent on the filtration. In order to obtain the maximum flow values shown, main flow filtration of 25 μm is recommended. The internal flow forces in the valve also affect the flow, and therefore the flow details shown for 4-way valves apply for normal application with two flow directions (e.g. from P to A and simultaneously return flow from B to T).

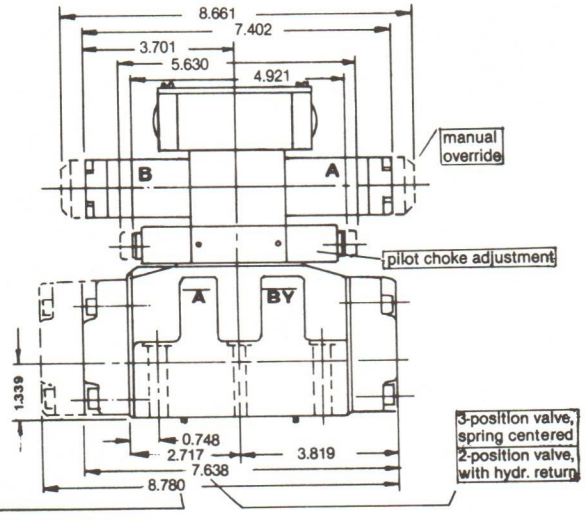
3-position valves, with spring or hydraulic centering (dimensions in inches)

WEH16

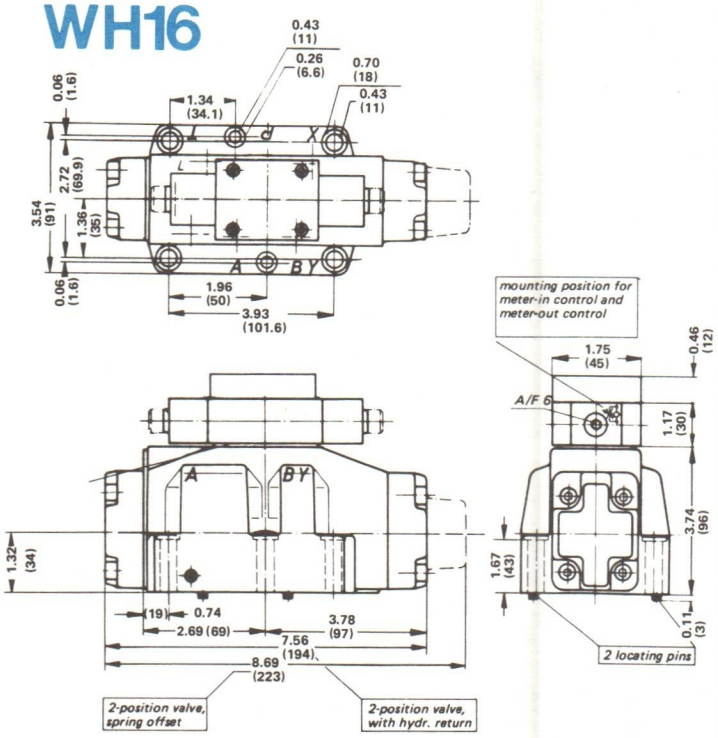




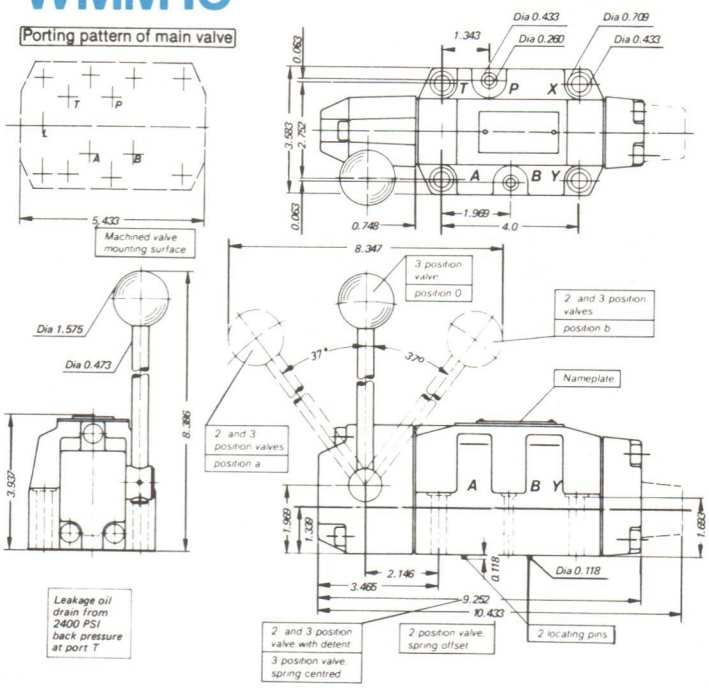




WH16

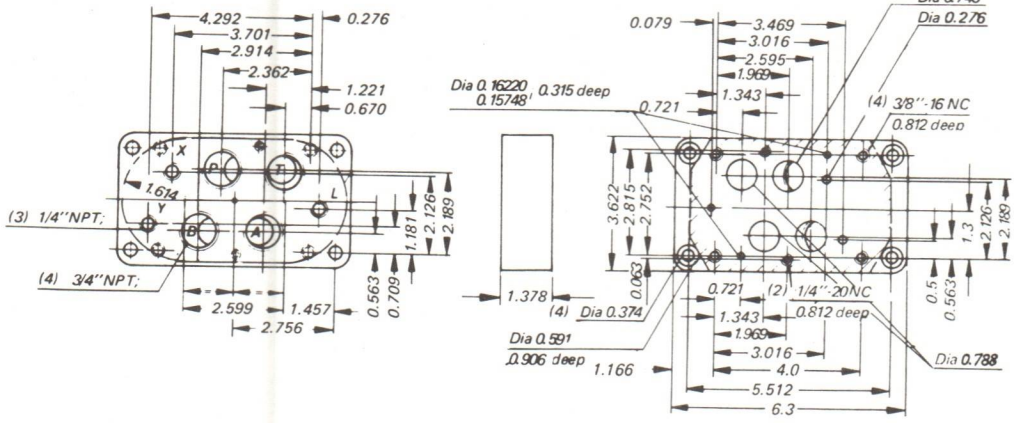


WMM16

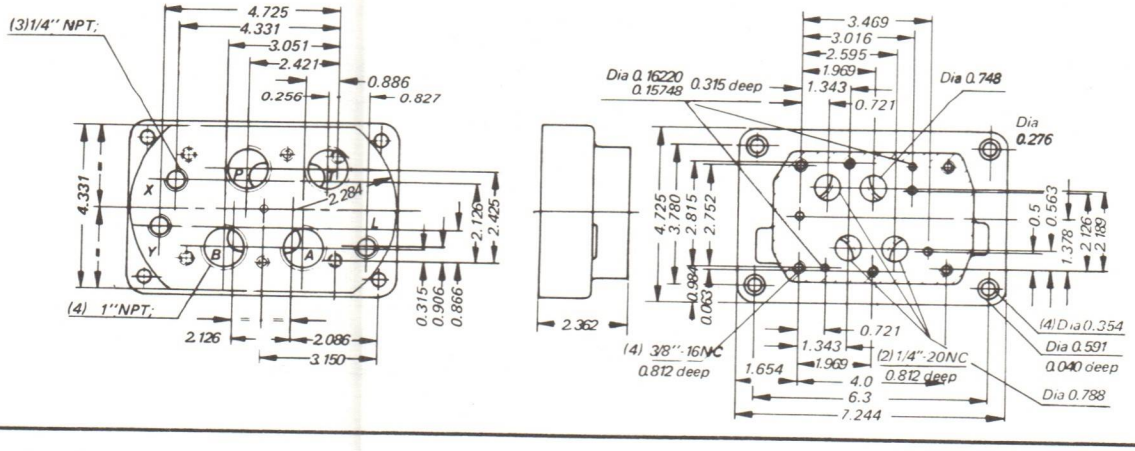


Subplates

G172/5



G174/5



Directional Control Valve

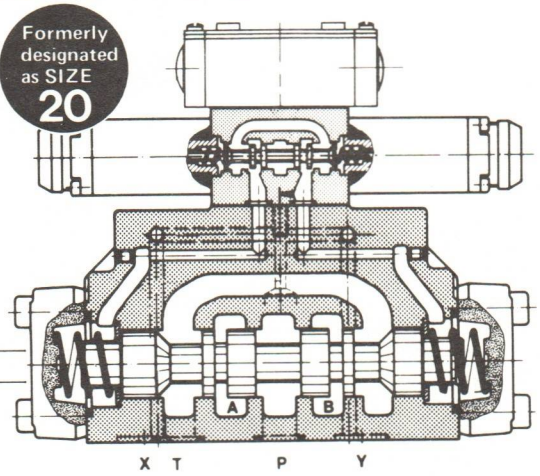
The 4WEH22 valve, Design-Series 60, is a solenoid controlled, pilot operated hydraulic 4 Way valve for high flow 105 GPM (400 1/min.) and pressures to 3000 PSI (210 bar).

The 4WE6 pilot valve is available with WET PIN solenoids or Rexroth Size 6 pilot valves to include... hand, (either lever or rotary operated)...air pilot...or the hydraulic pilot.

Internal or External piloting and Internal or External drain of the pilot section is available. This can be field changed by the use or the removal of plugs which are located to reduce the pilot valve for easy access. For internal pilot flow, four orifices can be selected in order to reduce the pilot oil flow to a safe operating rate. A back pressure check valve, for open center valves, is available when the pressure across the valve drops below 65 PSI (4.5 bar) which is required to shift the main valve spool.

up to 3000 PSI 105 GPM D06 Mount

Formerly designated as SIZE 20



Size 4WEH22 · 1" Refer to RA 24765 and RA 22828

Ordering Code

4 WEH 22 H C XX/OF 6AW220 N SD1 10 V/5

NUMBER OF WORKING PORTS
3 = 3 way 4 = 4 way

OPERATOR
EH = Sol. controlled hydraulic pilot
H = Hydraulic pilot operated

SIZE
22 = 1" (ANSI D06)

RETURN
H = Hydraulic Omit = Spring return

SPOOL

DESIGN SERIES
Omit = Subplate

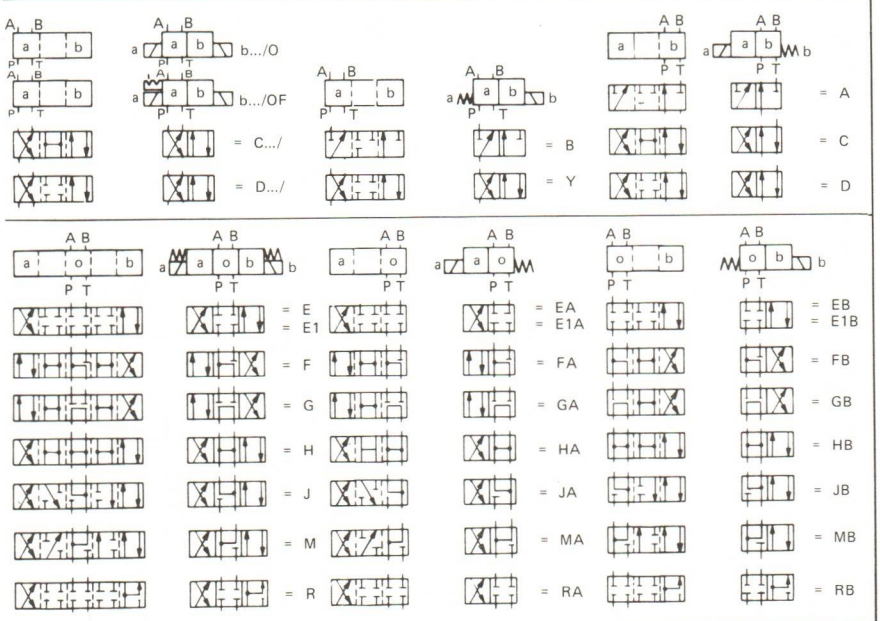
SPRING
Omit = Spring assist not req'd.
O = No spring, no detent
OF = No spring, with detents

OPTIONS

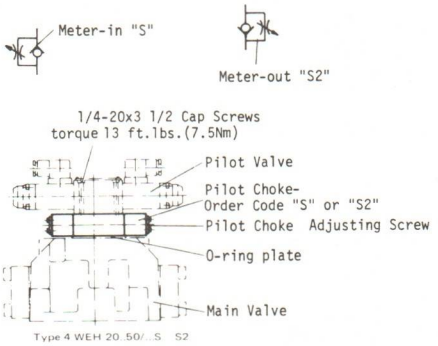
Omit	=	Without pilot valve (WH only)
6A	=	Size 6 pilot, wet pin (WEH 10, 16 & 20 only)
G + volt	=	DC (WEH only)
W + volt + HZ	=	AC (all except 120-60, omit) WEH only
E	=	Int. pilot - ext. drain
ET	=	Int. pilot - int. drain
T	=	Ext. pilot - int. drain
Omit	=	Ext. pilot - ext. drain
S	=	Pilot choke - meter in
S/D1	=	Pilot choke, meter in w/D1 press. reducing
D1	=	Pilot pressure reducing valve (1:0.66 reduction)
D	=	Top electrical box
DL	=	Top electrical box w/ind. lights

ADDITIONAL SPECIAL FEATURES
Are available to include; stroke limiter, limit switches, throttle orifices (0.031 to 0.118" dia) and pilot pressure insert (63 psi cracking pressure), consult factory.

SEALS
Omit = Buna-N
V = Viton



PILOT VALVE CHOKE--ORDERING CODE "S"(meter-in) "S2"(meter-out)



For field conversion meter-in to meter-out control:

1. Remove the Pilot Valve.
2. O-ring plate remains in place.
3. Turn pilot valve choke -upside down
4. Replace and bolt down the pilot valve.

Technical Data

Pressure Rating	A, B ports	3000 psi (210 bar)
	T port, w/ext. drain	3000 psi (210 bar)
	T port, w/int. drain	2300 psi (160 bar) DC sol.
	T port, w/int. drain	1500 psi (100 bar) AC sol.
	Y port, w/ext. drain	2300 psi (160 bar) DC sol.
	Y port, w/ext. drain	1500 psi (100 bar) AC sol.
Pilot Pressure, Max.	3000 psi (210 bar)	
Min.	3 position valve, w/ext. pilot, 125 psi (8.5 bar)	
Min.	2 position, spring offset, w/ext. pilot, 150 psi (10 bar)	
Min.	2 position, hyd. return, w/int. pilot 65 psi (4.5 bar)	
Fluid Operating Temperature	-22°F (-30°C) to +160°F (70°C)	
Viscosity Range	35 SSU (2.8cSt.) to 1750 SSU (380cSt.)	
Maximum Flow*	1000 psi (70 bar) 105 GPM (400 l/min.)	
	2000 psi (140 bar) 71 to 105 GPM (270 to 400 l/min.)	
	3000 psi (210 bar) 46 to 105 GPM (175 to 400 l/min.)	
	*varies with spool selection	
Weight (with subplate)	With 1 solenoid, 5.2 lbs. (11.5 kg)	
	With 2 solenoids, 5.4 lbs. (11.9 kg)	

Response Time For Spool Shifting*

Time to shift spool from center or zero to end position -- time in "ms"								
PILOT PRESSURE PSI (bar)	500 (35)		1000 (70)		2000 (140)		3000 (280)	
SOLENOID OPERATOR	AC	DC	AC	DC	AC	DC	AC	DC
3 position valve - spring centered ms	50	100	40	80	35	65	30	60
2 position valve - ms	100	160	90	110	75	95	70	85
TIME TO SHIFT SPOOL from end to center or zero position -- time in "ms"								
3 position valve - spring centered ms	35							
2 position valve - ms	90	95	65	70	50	55	45	50

* Internal hydraulic forces within the valve will affect the flow. The tables and charts are based on two directional flow. Two directional flow, for example, is flow from P to A and from B to T simultaneously.

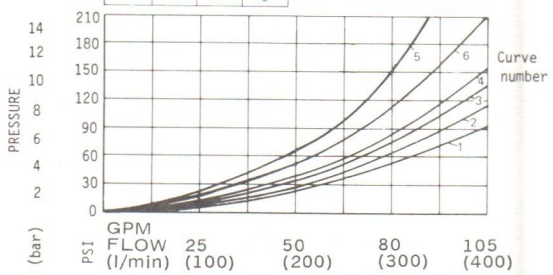
Pressure Drop at Varied Flow (175 SSU, 37cSt.)

CURVE NUMBER FOR VALVE SPOOL IN CENTER POSITION

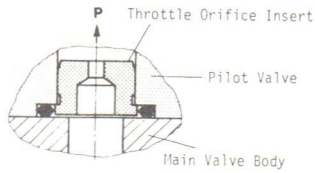
Spool Type	Direction of flow A - T	B - T	P - T
F	–	–	4
G	–	–	6
H	–	–	2
P	–	–	6

CURVE NUMBER FOR VALVE SPOOL IN SHIFTED POSITION

Spool Type	Direction of flow P - A	P - B	A - T	B - T
E	2	2	1	4
F	1	2	1	2
G	2	2	2	4
H	2	2	1	3
J	2	2	1	3
L	2	2	1	2
M	2	2	1	4
R	1	2	1	–



Throttle Orifice Insert Option

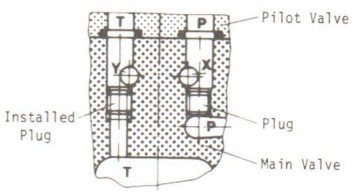


The THROTTLE ORIFICE INSERT is used to reduce the pilot oil supply flow to the pressure port P of the WE6 pilot valve.

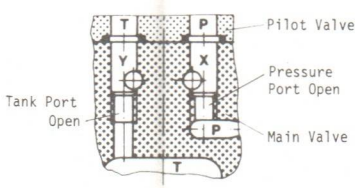
As an example, this Throttle Orifice Insert is used when the flow to the pilot valve exceeds the normal allowable flow through the pilot valve. This orifice should be used when a system accumulator is in the circuit ahead of the pressure port of the main valve and the pilot valve fluid supply is internal.

Main Valve Pilot Pressure and Drain

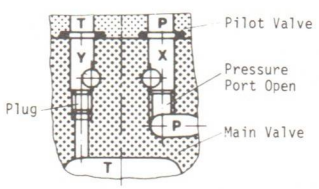
ORDERING CODE "omit"
External Pilot Supply & External Pilot Drain



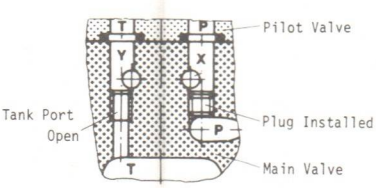
ORDERING CODE "ET"
Internal Pilot Supply & Internal Pilot Drain



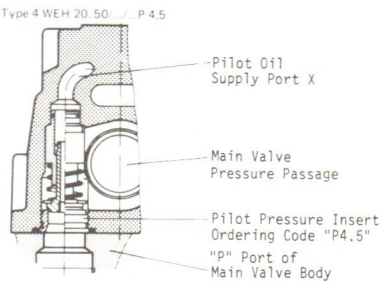
ORDERING CODE "E"
Internal Pilot Supply & External Pilot Drain



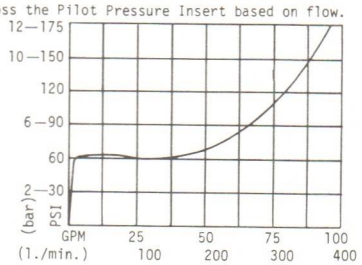
ORDERING CODE "T"
External Pilot Supply & Internal Pilot Drain

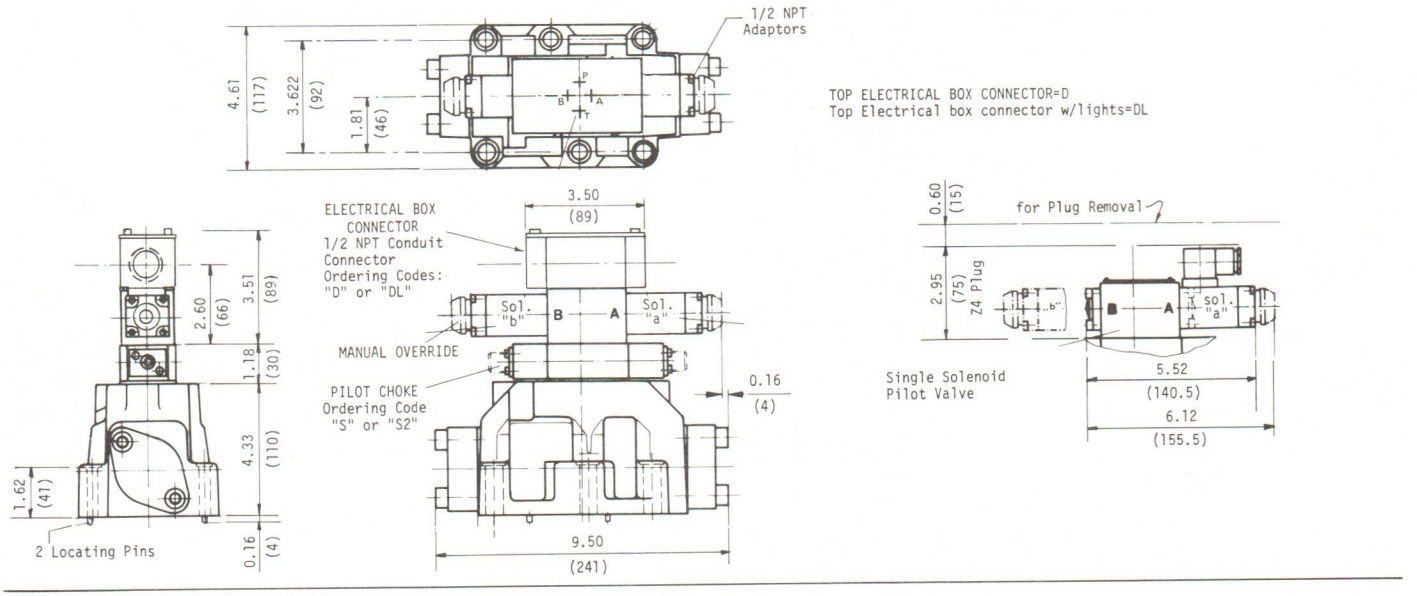


Pilot Pressure Insert

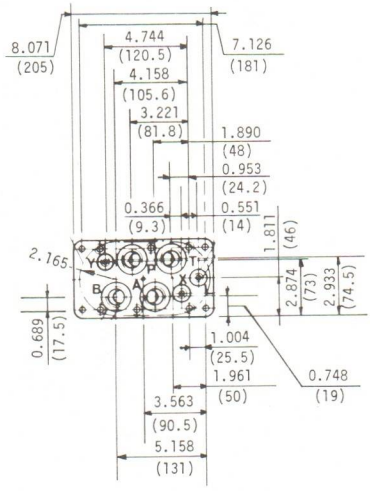

Type 4 WEH 20 50 / P 4.5
Pilot Oil Supply Port X
Main Valve Pressure Passage
Pilot Pressure Insert Ordering Code "P4.5"
"P" Port of Main Valve Body

Pressure drop across the Pilot Pressure Insert based on flow.

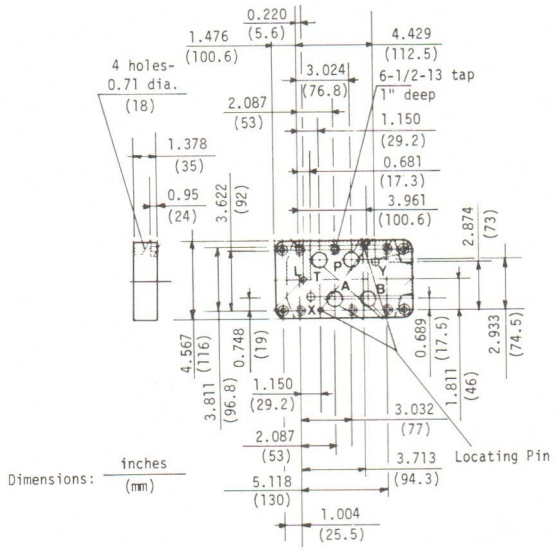


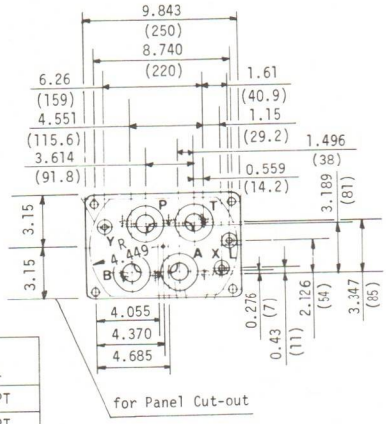


(Subplates, (1")(1-1/4")&(1-1/2"NPT)

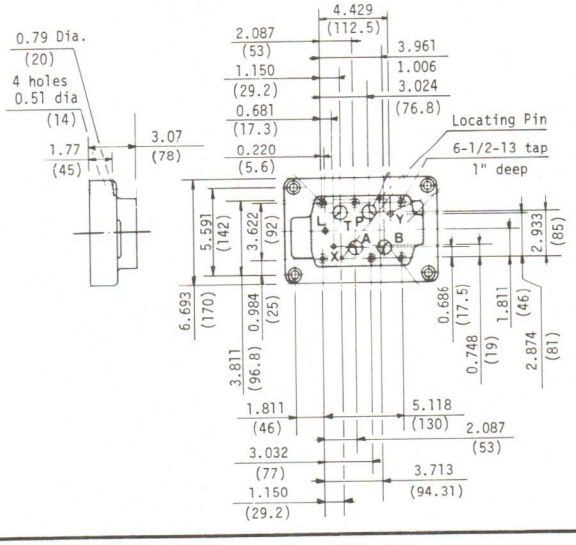


SUBPLATE MODEL NO.	PORTS A,B,P,& T	PORTS Y,X,& L
G151/5	1" NPT	1/4" NPT





SUBPLATE MODEL NO.	Ports A,B,P,& T	Ports Y,X,& L
G 154/5	1 1/4" NPT	1/4" NPT
G 156/6	1 1/2" NPT	1/4" NPT



DirectionalControlValve

The Size 25 (1") is available with AC/DC solenoid operator (WE), direct hydraulic pilot (WH), or direct-acting hand lever (WMM).

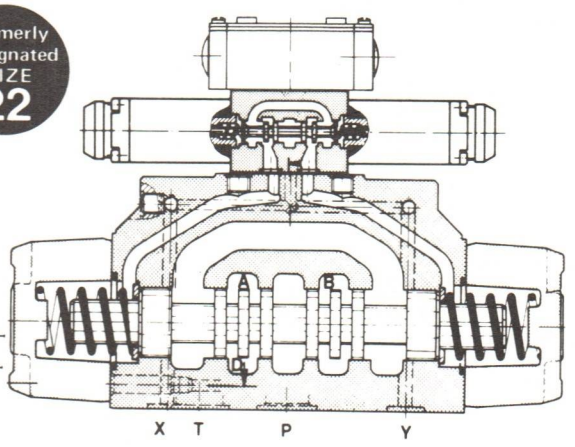
HYDRAULIC PILOT OPERATOR (WH)
Operation of the main spool is by means of direct application of hydraulic pressure. Spring or hydraulic spool centering is available.

HAND LEVER (WMM)
The hand lever operates via a pivot pin to apply direct mechanical pressure for spool shifting. The lever mechanism is fully encapsulated within a removeable valve head, and can be interchanged without dismantling the valve.

SOLENOID OPERATOR (WE)
Operation of the main spool is by means of a pilot valve, available with either DC or AC oil immersed solenoids. Main spool centering can be controlled by springs or hydraulic pressure. The pilot oil supply and drain can be provided either internally or externally.

up to 4000 PSI 172 GPM D06 Mount

Formerly designated as SIZE 22



SizeWEH25 · 1" Refer to RA 24770 and RA 22833

Ordering Code

4 WEH 25 H C XX/OF 10LW220 N SD1 10 V/5

NUMBER OF WORKING PORTS
3 = 3 way 4 = 4 way

OPERATOR
EH = Sol. controlled hydraulic pilot
H = Hydraulic pilot operated
MM = Hand lever

SIZE
25 = 1" Hi flow (ANSI D06)

RETURN
H = Hydraulic Omit = Spring return

SPOOL

DESIGN SERIES
Omit = Subplate

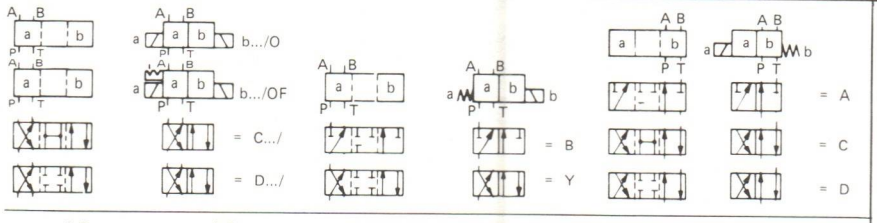
SPRING
Omit = Spring assist not req'd.
O = No spring, no detent
OF = No spring, with detents

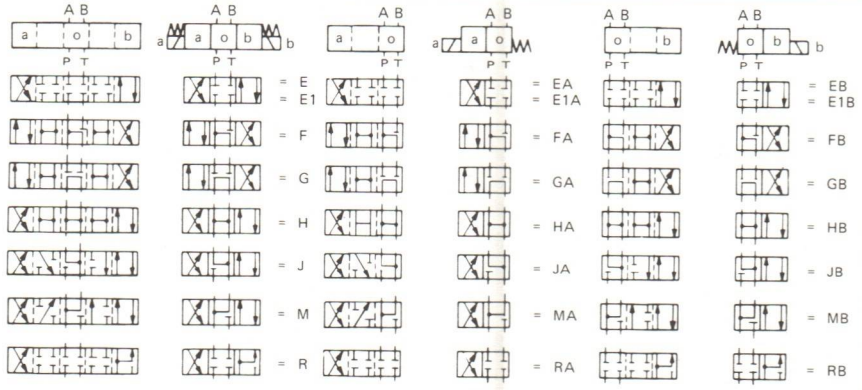
OPTIONS

Omit	=	Without pilot valve (WH only)
6A	=	Size 6 pilot, wet pin (WEH 10, 16 & 20 only)
10A	=	Size 10 pilot, oil immersed (WEH only)
10L	=	Size 10 pilot, air gap (WEH only)
G + volt	=	DC (WEH only)
W + volt + HZ	=	AC (all except 120-60, omit) WEH only
E	=	Int. pilot - ext. drain
ET	=	Int. pilot - int. drain
T	=	Ext. pilot - int. drain
Omit	=	Ext. pilot - ext. drain
S	=	Pilot choke - meter in
S/D1	=	Pilot choke, meter in w/D1 press. reducing
D1	=	Pilot pressure reducing valve (1:0.66 reduction)
D	=	Top electrical box
DL	=	Top electrical box w/ind. lights

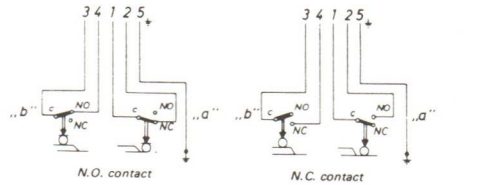
ADDITIONAL SPECIAL FEATURES
Are available to include; stroke limiter, limit switches, throttle orifices (0.031 to 0.118" dia) and pilot pressure insert (63 psi cracking pressure), consult factory.

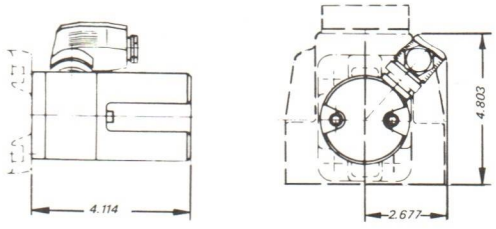
SEALS
Omit = Buna-N
V = Viton





Main Valve Limit Switch Option





Limit switch 'a' is operated when the main valve spool has reached position 'a'.

Limit switch 'b' is operated when the main valve spool has reached position 'b'.

When a stroke limiter is used, the respective limit switch ceases to function.

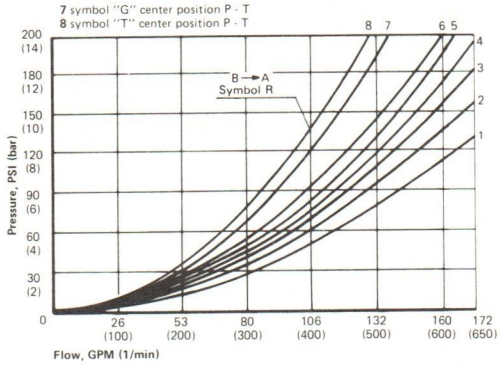
Contact Rating: D.C. at 30 V = 2 A; A.C. at 250 V = 5 A

Technical Data

Weight (valve) approx., WH	28.6 lbs.
WMM	28.6 lbs.
WE	W/1 solenoid, 38.8 lbs w/2 solenoids, 39.6 lbs.
Subplates, add	G151, 11 lbs. G154 & G156, 35 lbs.
Hydraulic medium	Mineral oil and phosphate ester fluids
Viscosity range	35 to 1750 SSU
Fluid temperature range	-22°F to +160°F
Max. operating pressure, WH type	Ports P, A & B, 4000 psi
	Port T, 3500 psi
Max. pilot pressure	3500 psi
Min. pilot pressure	3 position valves, 120 psi
	2 position w/spring offset, 150 psi
	2 position w/hydraulic return, 75 psi
Pilot volume for shifting	3 position valves, spring centered, 0.59 in^3
	2 position valves, 1.18 in^3
3 position valves, hyd. centering	From zero to "A" position, 0.31 in^3
	From "A" to zero position, 0.28 in^3
	From zero to "B", 0.59 in^3
	From "B" to zero, 0.28 in^3

Voltages available AC	120 & 220 V, 60 cycle
DC	12 & 2 V
Power requirement, DC	26 W
Holding current, AC	46 VA
In-rush current, AC	130 VA
Response time (on)DC	40 MS
AC	25 MS
Response time (off)DC & AC	20 MS
Max. ambient temperature	120°F
Max. coil temperature	300°F
Max. shifting Frequency, DC	15,000 p/hr
AC	7200 p/hr

Performance Curves (measured at ν = 36 cSt and t = 50° C)



Symbol	Switching Position			
	P-A	P-B	A-T	B-T
E	1	1	1	3
F	1	4	3	3
G	3	1	2	4
H	4	4	3	4
J	2	2	3	5
M	4	4	1	4
R	2	1	1	–

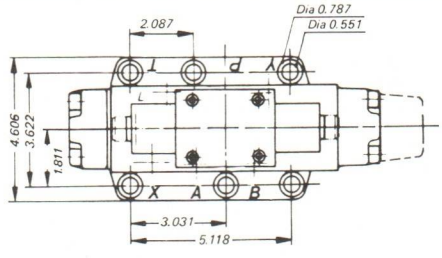
Due to silting the function of the valves is dependent on the filtration. In order to obtain the maximum flow values shown, main flow filtration of 25 µm is recommended. The internal flow forces in the valve also affect the flow, and therefore the flow details shown for 4-way valves apply for normal application with two flow directions (e.g. from P to A and simultaneously return flow from B to T).

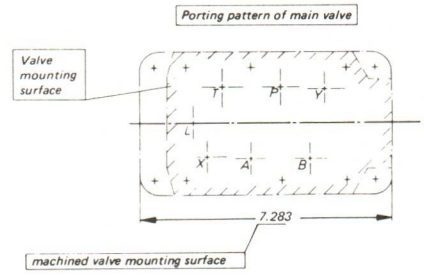
Max. Flow (in GPM) for Various Spool Types at Various Pressures (PSI)

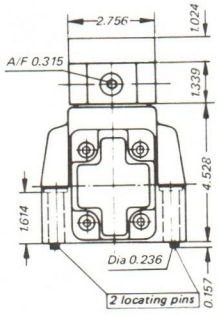
SPOOL TYPE	1000	2000	3000	4000
E, M, R, C, D	172	172	172	172
F	172	145	114	87
G	106	106	106	106
H	172	172	145	106
J	172	172	172	159

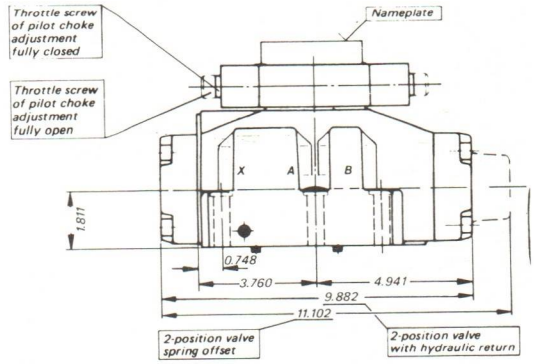
Dimensional Data

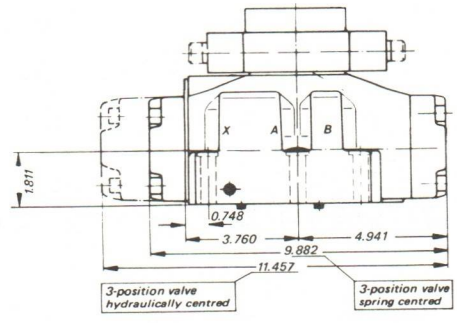
WH25



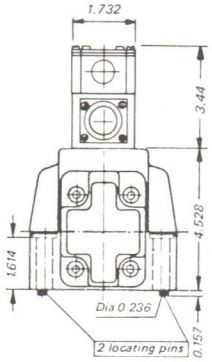


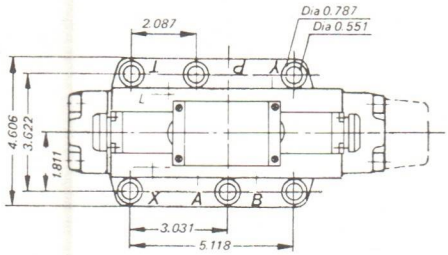


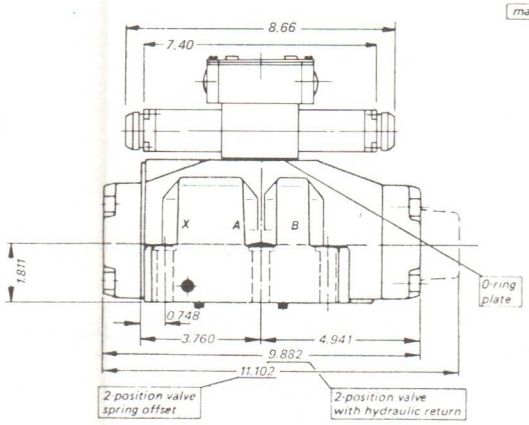


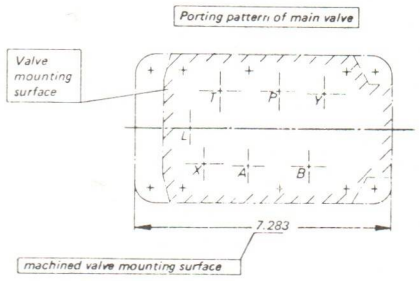


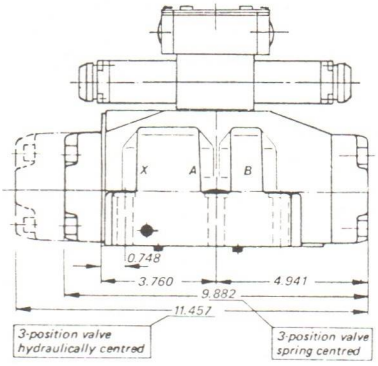
WEH22



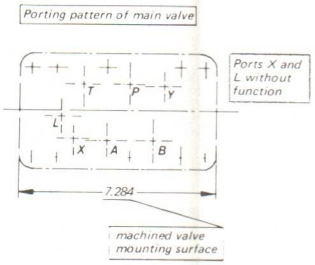


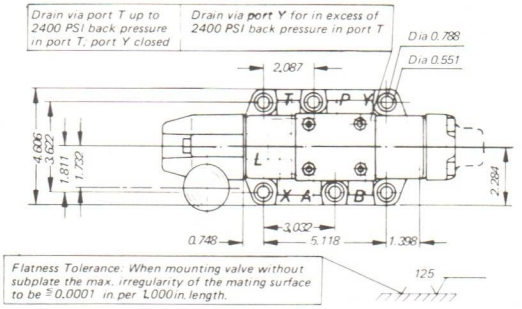


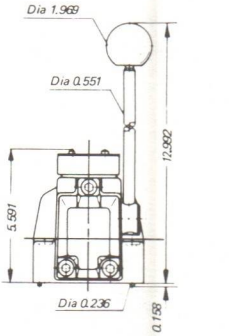




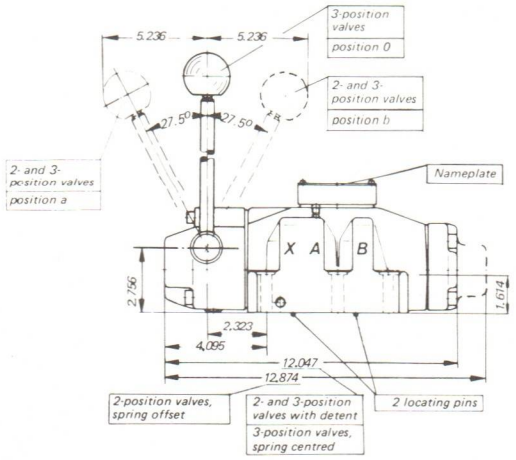
WMM22







For valves without subplated the mounting screws have to be ordered separately
Mounting screws: (6) 1/2"-13NC x 21/2"
tightening torque 118 ft-lb



Subplate

For complete dimensional data on subplates applicable to Size 22 valves, refer to page 2-21

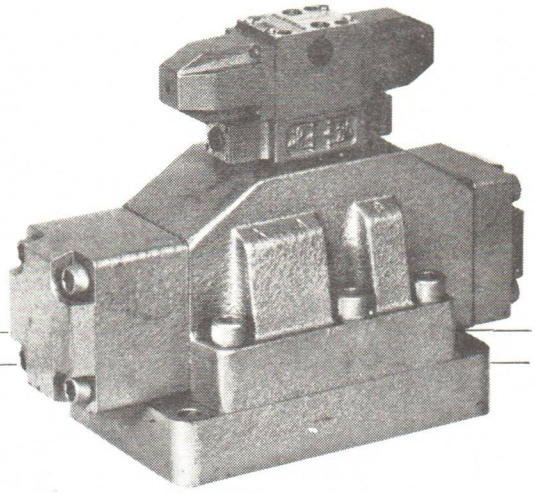
DirectionalControlValve

Operation of the main spool is by means of pilot valve, available with either DC or AC air gap or oil immersed solenoids. Manual override on the pilot valve solenoids allows operation of the main spool without energization of the solenoids, provided pilot pressure is available. The main valve spool is held in the center or end positions by springs or hydraulic pressure.

The pilot oil supply and drain can be provided internally or externally.
The directional control valves size 32 are available for an operating pressure up to 5000 PSI.

Design Features:
- subplate mounting
- cast oil passages
- spring or hydraulic centering of main spool
- Interchangability of spools.

Depending on the application, the valves can be supplied with the following additional features:
- pilot choke adjustment
- stroke limiter on main spool
- main spool position indicator
- limit switch on main spool
- pilot pressure insert in main valve
- throttle orifices to reduce pilot oil supply



SizeWEH32 · 1 1/2"

Refer to RA 24778 and RA 22843

Up to 5000 PSI 290 GPM D10 Mount

Ordering Code

4 WEH 32 H C XX/OF 10LW220 N SD1 10 V/5

NUMBER OF WORKING PORTS
3 = 3 way 4 = 4 way

OPERATOR
EH = Sol. controlled hydraulic pilot
H = Hydraulic pilot operated
MM = Hand lever

SIZE
32 = 1-1/2" (ANSI D10)

RETURN
H = Hydraulic Omit = Spring return

SPOOL

DESIGN SERIES
Omit = Subplate

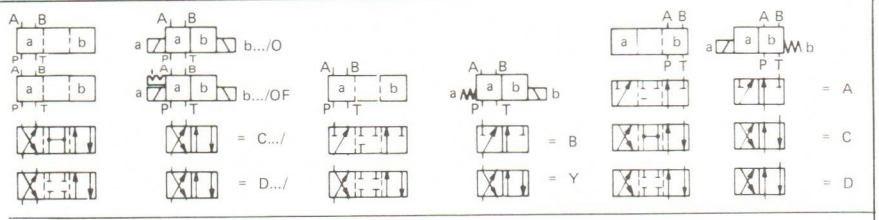
SPRING
Omit = Spring assist not req'd.
O = No spring, no detent
OF = No spring, with detents

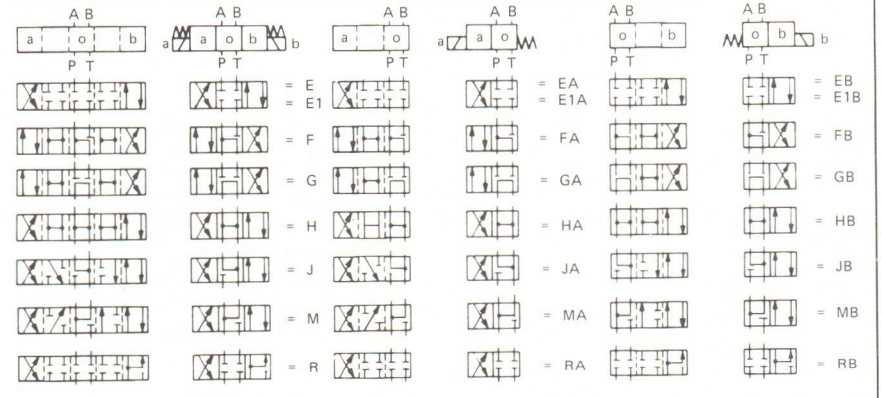
OPTIONS

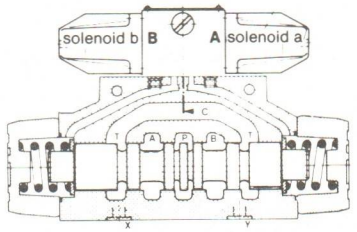
Omit	=	Without pilot valve (WH only)
6A	=	Size 6 pilot, wet pin (WEH 10, 16 & 20 only)
10A	=	Size 10 pilot, oil immersed (WEH only)
10L	=	Size 10 pilot, air gap (WEH only)
G + volt	=	DC (WEH only)
W + volt + HZ	=	AC (all except 120-60, omit) WEH only
E	=	Int. pilot - ext. drain
ET	=	Int. pilot - int. drain
T	=	Ext. pilot - int. drain
Omit	=	Ext. pilot - ext. drain
S	=	Pilot choke - meter in
S/D1	=	Pilot choke, meter in w/D1 press. reducing
D1	=	Pilot pressure reducing valve (1:0.66 reduction)
D	=	Top electrical box
DL	=	Top electrical box w/ind. lights

ADDITIONAL SPECIAL FEATURES
Are available to include; stroke limiter, limit switches, throttle orifices (0.031 to 0.118" dia) and pilot pressure insert (63 psi cracking pressure), consult factory.

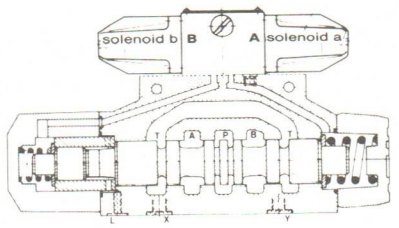
SEALS
Omit = Buna-N
V = Viton







Type 4 WEH32....50/....



Type 4 WEH32 H....50/....

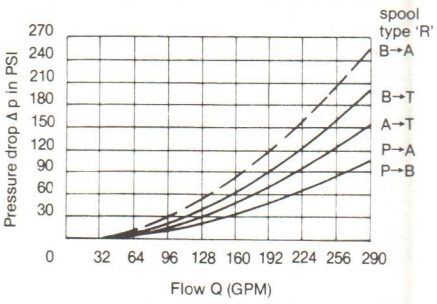
Technical Data			
Weight (valve)	with 2 solenoids max. 112 LBS; with 1 solenoid max. 108 LBS		
Hydraulic medium	Mineral oil (accord. to pilot valve)		
Viscosity range	35 to 1750 SSU		
Fluid temperature range	– 20 to + 160° F		
Max. operating pressure	Valve type H — 4 WEH 32 ...		
Ports P • A • B	5000 PSI		
Pilot drain Y = external Port T	3500 PSI		
Min. pilot pressure Max. pilot pressure 3500 PSI	P_{st} = 150 PSI *		
Total response time of valve from zero into end position (with AC voltage)			
at pilot pressure p_{st}	700 PSI	2100 PSI	3500 PSI
3-position valves, spring centered	60 ms	45 ms	35 ms
2-position valves	105 ms	85 ms	75 ms
Total response time of valve from end into zero position			
3-position valves, spring centered	95 ms		
2-position valves	105 ms	85 ms	75 ms
The total response times from zero into end position increases by 20 ms for DC voltage. For applications to other specifications please consult us.			

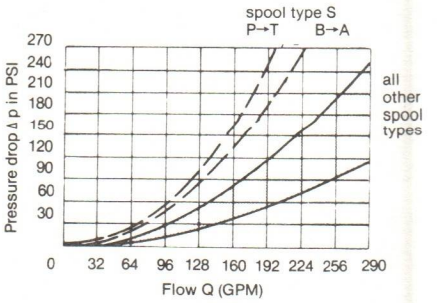
pilot valve

Solenoid type	DC solenoid dry	DC solenoid wet	AC solenoid dry	AC solenoid wet
Catalogue sheet size 8 (3/8")	RA 23 286		RA 23 287	
Catalogue sheet size 10 (1/2")	RA 23 299	RA 23 196	RA 23 300	RA 23 197
Power requirement	25 W (43 W)	25 W (35 W)	—	—
Holding current	—	—	46 VA (64 VA)	84 VA (130 VA)
In-rush current	—	—	230 VA (430 VA)	310 VA (530 VA)
Duty cycle	100%			
Voltage Rating	12; 24; 42; 60; 110; 180; 195 & 220 V		42; 110; 127; 220V, 50 Cyc.; 120 & 220 V, 60 Cyc.	

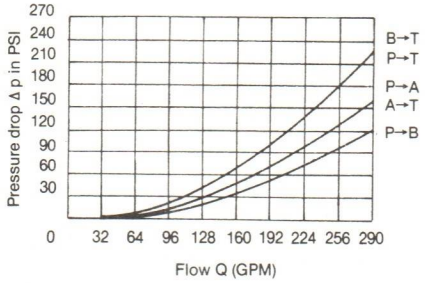
Performance Curves (pressure drop Δ p related to flow Q at 172 SSU)

Δ p-Q-characteristic for spool types E, W and R





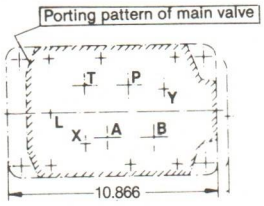
Δ p-Q-characteristic for spool types G and T



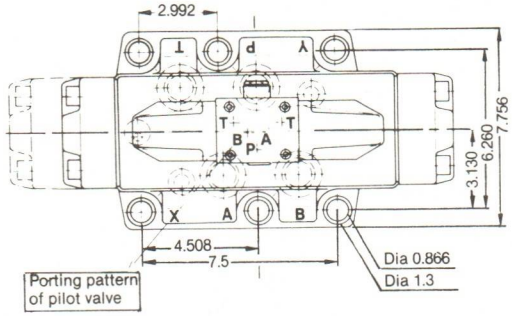
Due to silting the function of the valves is dependent on the filtration. In order to obtain the maximum flow values shown, main flow filtration of 25 μm is recommended. The internal flow forces in the valve also affect the flow, and therefore the flow details shown for 4-way valves apply for normal application with two flow directions (e.g. from P to A and simultaneously return flow from B to T).

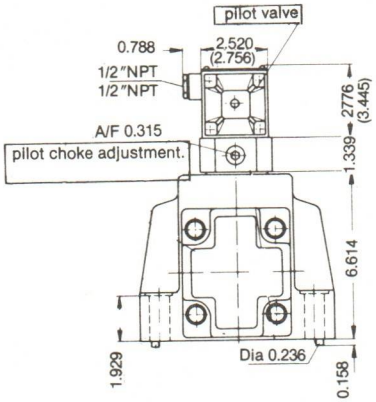
	Max. performance data	2-position valves, spring offset 3-position valves, spring centered					Pilot pressure insert required when X = internal for
	Flow (GPM) for spool types	at pressure (PSI) of 1000	2000	3000	4000	5000	
line I	E, J, C, D, M, R,	290	277	228	198	180	C basically; up to approx. 53 GPM
line II	F, G, H,	217	166	135	119	106	F, G, H,

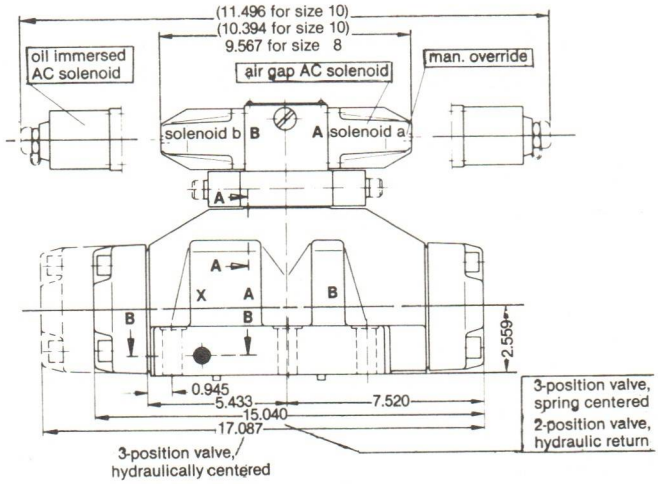
WEH



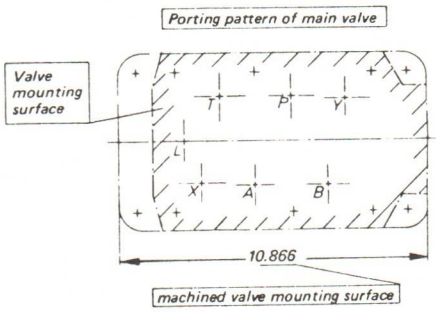
For valves without subplates the mounting screws have to be ordered separately.
Mounting screws: (6) 3/4"-10NC x 31/4"
tightening torque 420 ft-lb

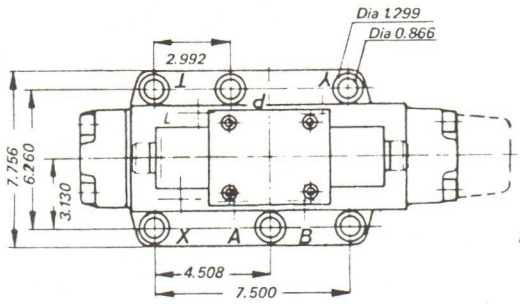


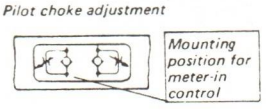


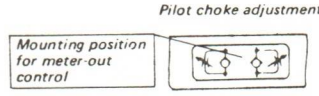


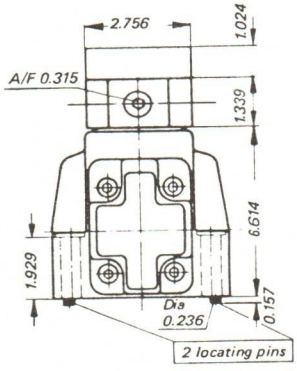
WH

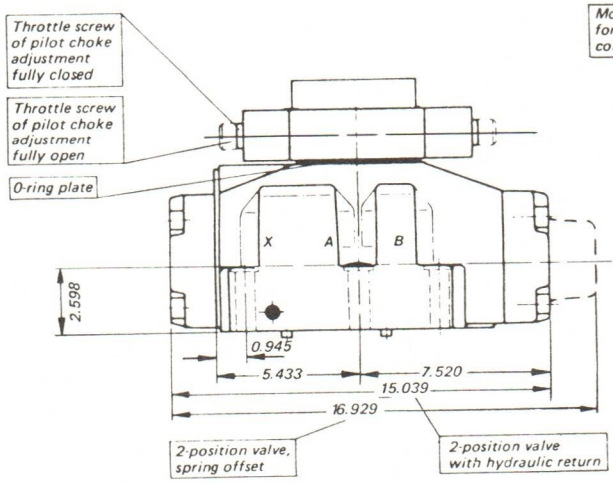








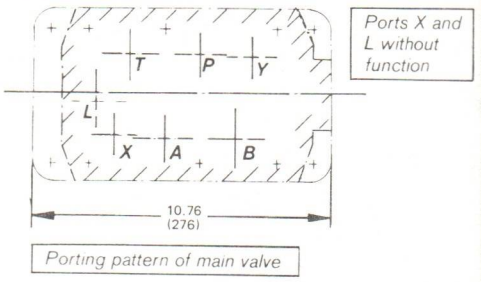


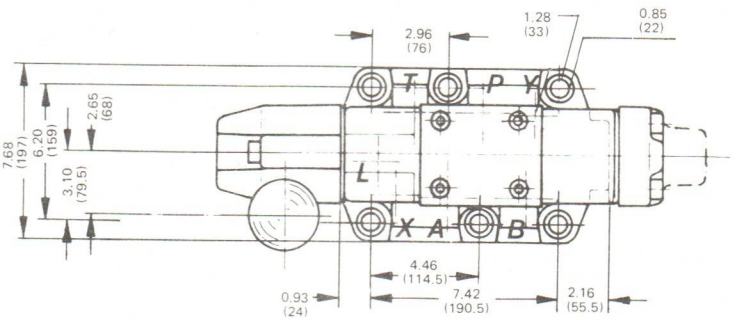


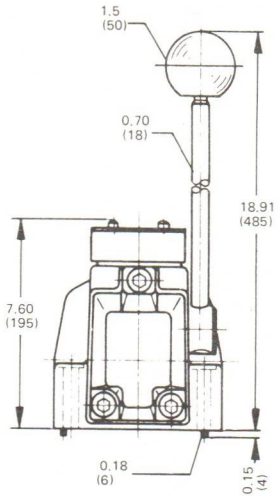
Cover mounting screws

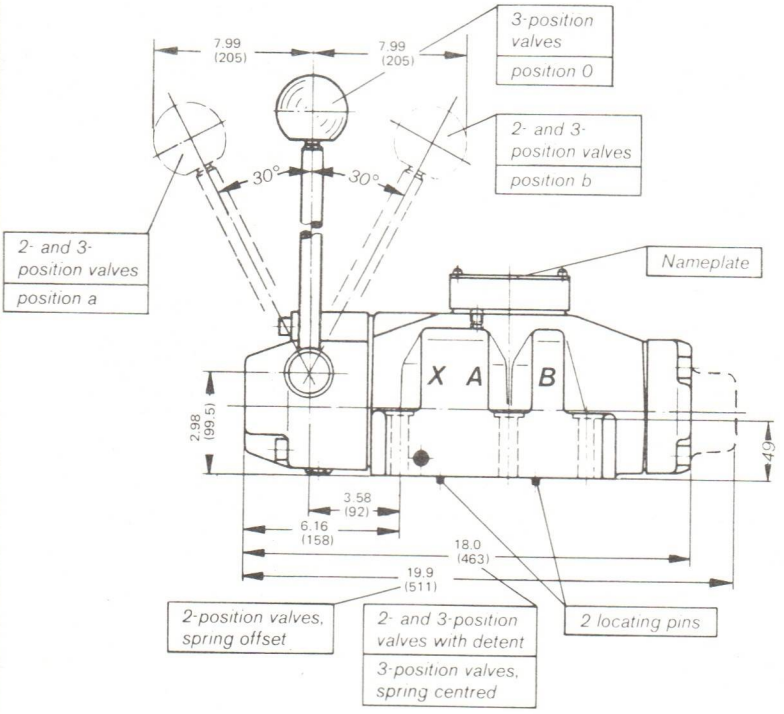
with choke adjustment (4) 1/4"-20NC x 2 1/2" Tightening torque 13 ft-lb
without pilot choke adjustm. (4) 1/4"-20NC x 1" Tightening torque 13 ft-lb

WMM

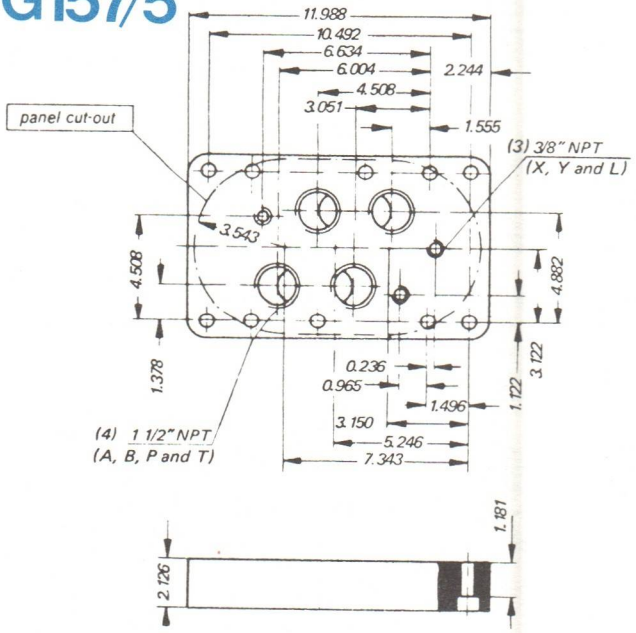

T
P
Y
L
X
A
B
10.76
(276)
Ports X and L without function
Porting pattern of main valve

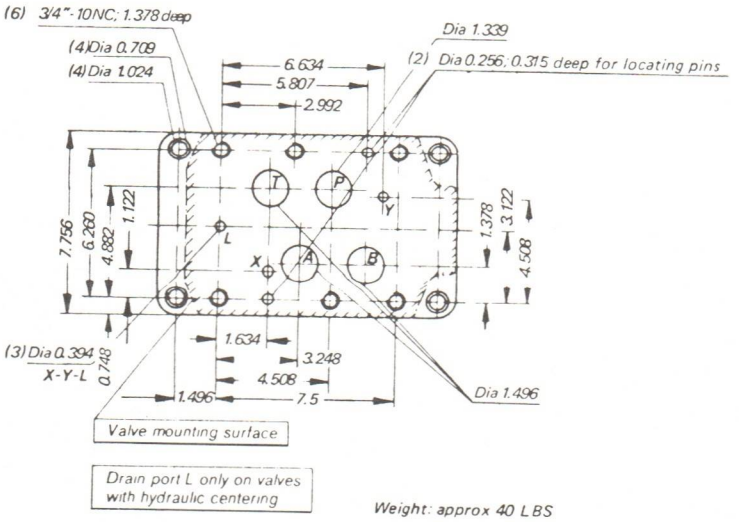

2.96
(76)
1.28
(33)
0.85
(22)
T
P
Y
L
X
A
B
7.68
(197)
6.20
(159)
2.65
(68)
3.10
(79.5)
4.46
(114.5)
0.93
(24)
7.42
(190.5)
2.16
(55.5)


1.5
(50)
0.70
(18)
18.91
(485)
7.60
(195)
0.18
(6)
0.15
(4)


7.99
(205)
7.99
(205)
3-position valves
position 0
2- and 3-position valves
position b
30°
30°
2- and 3-position valves
position a
Nameplate
X
A
B
2.98
(99.5)
49
3.58
(92)
6.16
(158)
18.0
(463)
19.9
(511)
2-position valves, spring offset
2- and 3-position valves with detent
3-position valves, spring centred
2 locating pins

G157/5


11.988
10.492
6.634
6.004
4.508
3.051
2.244
1.555
panel cut-out
(3) 3/8" NPT
(X, Y and L)
3.543
4.508
4.882
1.378
3.122
0.236
0.965
1.496
1.122
3.150
5.246
7.343
(4) 1 1/2" NPT
(A, B, P and T)
1.181
2.126


(6) 3/4"-10NC; 1.378 deep
(4) Dia 0.709
(4) Dia 1.024
Dia 1.339
(2) Dia 0.256; 0.315 deep for locating pins
6.634
5.807
2.992
T
P
Y
L
X
A
B
7.756
6.260
4.882
1.122
1.378
3.122
4.508
(3) Dia 0.394
X-Y-L
0.748
1.634
3.248
4.508
1.496
7.5
Dia 1.496
Valve mounting surface
Drain port L only on valves with hydraulic centering
Weight: approx 40 LBS

Directional Control Valve Capability from Rexroth

A hydraulic valve that speaks 16 languages

If you're designing in hydraulics, Rexroth backs you up with great products and services. In this country and 28 others, worldwide.

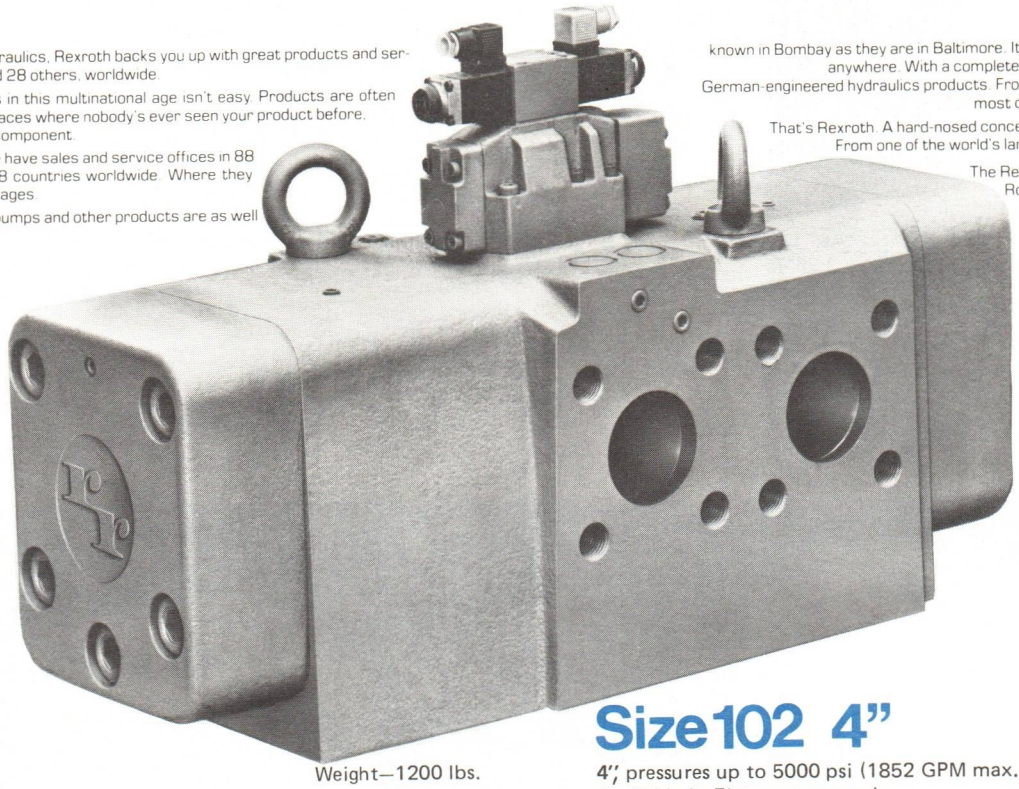
Designing for hydraulics in this multinational age isn't easy. Products are often shipped worldwide. To places where nobody's ever seen your product before, much less its hydraulic component.

Not so with Rexroth. We have sales and service offices in 88 cities in the U.S., and 28 countries worldwide. Where they speak a total of 16 languages.

This means our valves, pumps and other products are as well known in Bombay as they are in Baltimore. It means we can back you up anywhere. With a complete line of tough, hard-working, German-engineered hydraulics products. From the simplest valve. To the most complex integrated system.

That's Rexroth. A hard-nosed concern for quality and economy. From one of the world's largest hydraulics producers.

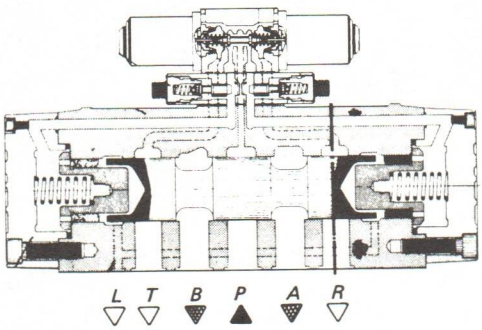
The Rexroth Corp., 2315 City Line Road, Bethlehem, PA. 18018



Weight—1200 lbs.

Size 102 4"

4", pressures up to 5000 psi (1852 GPM max.).
Available in Flange mount only.
REQUEST RA 24 812



CROSS SECTION
Typical for Sizes 52, 62 and 82
(Hydraulically centered main spool)

Size 82 3½"

3 1/2", pressures up to 5000 psi (1190 GPM max.).
REQUEST RA 24 806

Size 62 3"

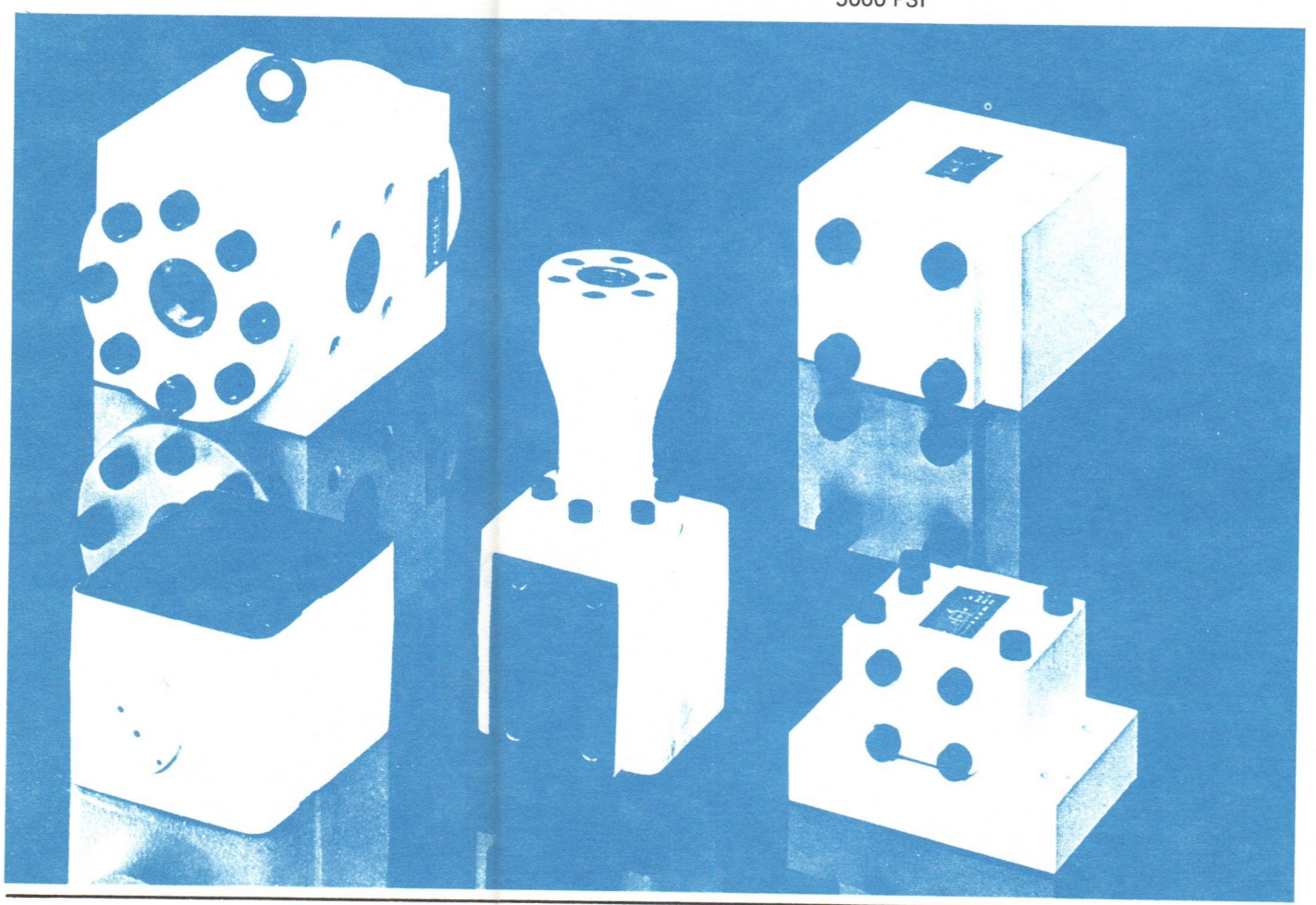
3", pressures up to 5000 psi (794 GPM max.).
Manifold or flange mount available.
REQUEST RA 24 798

Size 52 2½"

2 1/2", pressures up to 5000 psi (528 GPM max.).
Indirect or direct operated main spool. Manifold or Flange mount available.
REQUEST RA 24 792

Summary | CHECK & PREFILL VALVES

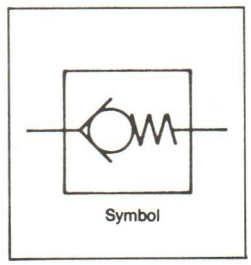
TYPE	REXROTH CODE	DESIGN	SIZE/CAPABILITY	PAGE NO.
CHECK VALVES	S	In-Line (NPT) or Subplate	1/4" thru 1-1/2" up to 106 GPM 5000 PSI	3-1
		Flanged or Manifold	2" thru 6" up to 4000 GPM 5000 PSI	3-9
	RV	In-Line (NPT or SAE)	1/4" thru 2" up to 150 GPM 5000 PSI	3-2
PILOT OPERATED CHECKS	SL/SV	In-Line (NPT) or Subplate	1/4" thru 1-1/2" up to 106 GPM 5000 PSI	3-3 to 3-5
	Z25	Sandwich Type	1/4" (D01) thru 1" (D06) up to 75 GPM 5000 PSI	3-6 to 3-8
	SL/SV	Flanged or Manifold	2" thru 6" up to 1,700 GPM 5000 PSI	3-9
PREFILL VALVES	SF	Flanged or Tank Mounted	2" thru 14" up to 6,136 GPM 5000 PSI	3-10 & 3-11



CheckValves

The check valve type S serve to give leakfree closure in one direction and free return flow in the other.
The stroke of the valve poppet is limited by a stop. The built-in spring supports the closing stroke, and also serves to hold the valve poppet in the closed position.
Four versions are available, with cracking pressures of 7, 22 45 or 75 PSI or without a spring.
A check valve cartridge is also available, suitable for mounting in manifold blocks. Two models are available: straight or angled valve cartridge.

Inline NPT or Cartridge



Type S Sizes 1/4" to 11/2"

106 GPM
5000 PSI

Refer to **RA 20377**

Ordering Code

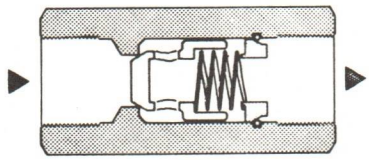
S 15 A 1 X/5

- SIZE
  - 6 = 1/4" (Code "A" only)
  - 8 = 3/8" (Code "A" only)
  - 10 = 1/2"
  - 15 = 3/4" (Code "A" only)
  - 20 = 1"
  - 25 = 1-1/4" (Code "A" only)
  - 30 = 1-1/2"
- MOUNTING
  - A = Inline (NPT)
  - P = Subplate
- CRACKING PRESSURE
  - 0 = No springs
  - 1 = 7 PSI
  - 2 = 22 PSI
  - 3 = 45 PSI
  - 5 = 75 PSI (Sizes 10 - 30 only)
- DESIGN SERIES

Technical Data (Valve description: RA 20 000) Spares information: RE 20 377-E)

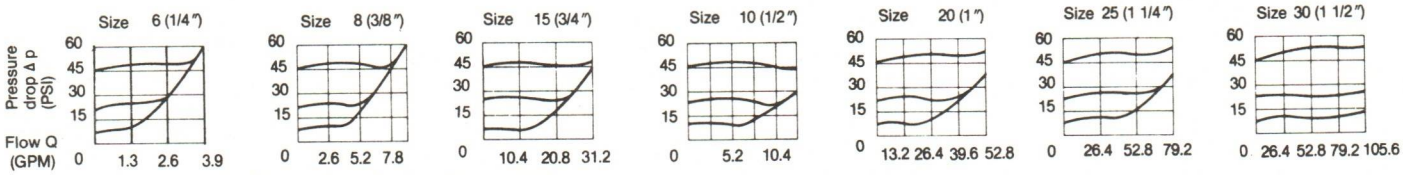
Hydraulic medium	Mineral oils
Fluid temperature range	– 22 to + 176° F
Viscosity range	35 to 1750 SSU
Max. operating pressure	up to 4500 PSI

Cracking pressure (PSI)	7 (Type No. 1); 22 (No. 2); 45 (No. 3); 72 (No. 5)						
Size	6 (1/4")	8 (3/8")	10 (1/2")	15 (3/4")	20 (1/2")	25 (1 1/4")	30 (1 1/2")
Flow Rating (GPM) Velocity = 20 ft/s	2.6	4.8	7.9	17.2	30.4	46.3	68.8



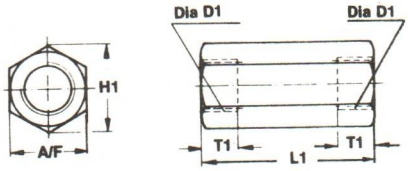
Section

Performance Curves



Pressure drop Δ p related to flow Q, shown for various cracking pressures

Unit Dimensions (in inches)

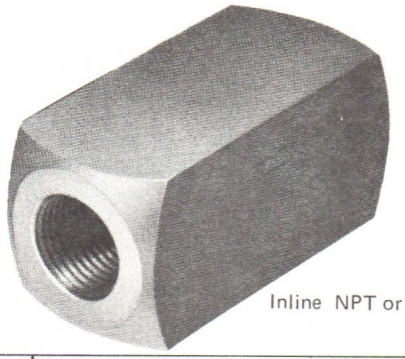


Size	6 (1/4")	8 (3/8")	10 (1/2")	15 (3/4")	20 (1")	25 (1 1/4")	30 1 1/2")
D1	1/4 "NPT	3/8 "NPT	1/2 "NPT	3/4 "NPT	1 "NPT	1 1/4" NPT	1 1/2" NPT
H1	0.866	1.102	1.358	1.634	2.087	2.717	2.953
L1	2.283	2.283	2.835	3.346	3.858	4.724	5.197
T1	0.472	0.472	0.551	0.630	0.709	0.787	0.866
A/F	0.748	0.945	1.181	1.417	1.811	2.362	2.559
Weight Lbs	0.22	0.44	0.66	1.1	2.2	4.4	5.5

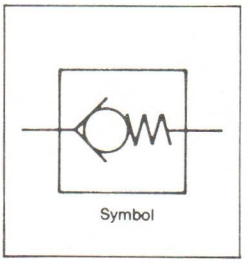
Type RV Sizes 1/4" to 2"

1/4" to 2" Threaded NPT or SAE (UNF–2B)
5000 PSI (350 bar) to 160 GPM (600 l/min)

Refer to **RA 20390**



Inline NPT or SAE



Ordering Code

RV – 8 – 1 X/5

SIZE

	NPT	SAE
8 =	1/4"	7/16–20
10 =	3/8"	9/16–18
12 =	1/2"	3/4–16
16 =	3/4"	1-1/16–12
20 =	1"	1-5/16–12
25 =	1-1/4"	1-5/8–12
30 =	1-1/2"	
40 =	2"	

CRACKING PRESSURE
1 = 7.25 PSI
4 = 65 PSI

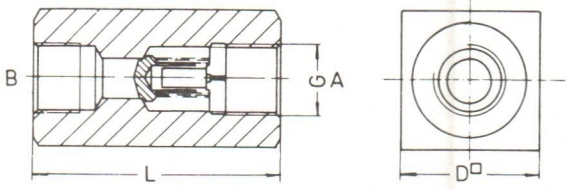
DESIGN SERIES

CONNECTIONS
5 = NPT
12 = SAE

Technical Data

Operating Pressure	5000 psi (350 bar)
Cracking Pressure	7.25 psi (0.5 bar) and 65 psi (4.5 bar)
Flow Rating	See Pressure Flow chart
Operating Temperature	-40°F (-20°C) to +212°F (+100°C)
Fluid Recommendations	Petroleum base hydraulic oil and synthetic fluids
Viscosity Range	35 SSU (2.8cSt) to 1750 SSU (380cSt)
Mounting Position	Optional
Weight	See Installation Dimension chart

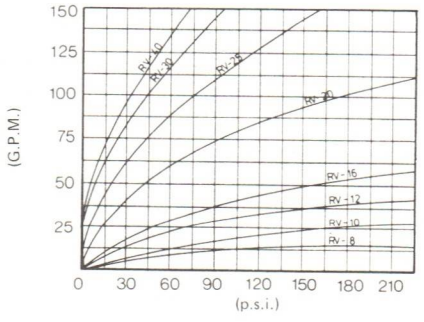
INSTALLATION DIMENSIONS: in inches & weight in pounds



Size	Thread (NPT) G	D	Weight L	Weight (lb)
6	1/4"	.984	2.165	0.44
8	3/8"	1.181	2.559	0.88
10	1/2"	1.378	2.874	1.54
16	3/4"	1.772	3.465	2.65
20	1"	1.969	4.999	4.4
25	1-1/4"	2.362	5.630	7.28
30	1-1/2"	2.756	5.680	9.62
40	2"	3.543	6.496	15.88

Performance Curves

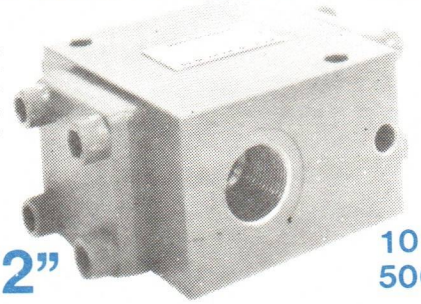
PRESSURE DROP
PRESSURE–FLOW CHART:
in PSI and GPM (oil 122°F & 165 SSU)



CheckValves

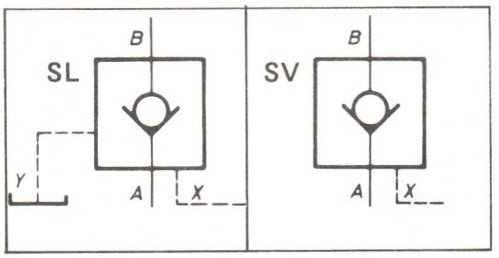
Refer to **RA 21466**

The Pilot Operated Check Valves type SV and SL are hydraulically piloted to open with built-in decompression poppets, allowing leak free closure in one direction (B to A) until a pilot signal is introduced, and free flow in the opposite direction (A to B).
Valve type SV is with internal drain.
Valve type SL is with external drain.



Type SV/SL
Sizes 1/4" to 1 1/2"

106 GPM
5000 PSI



Ordering Code

SL 20 P XX V/5

DESIGN SERIES

VALVE TYPE
- SV = Pilot operated without ext. drain
- SL = Pilot operated with ext. drain

SIZE
- 10 = 1/2"
- 15 = 3/4"
- 20 = 1"
- 25 = 1-1/4"
- 30 = 1-1/2"

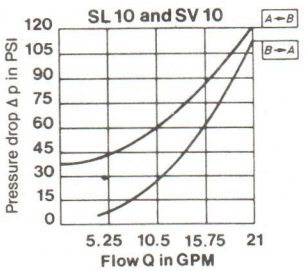
CONNECTIONS
- G = Inline (NPT)
- P == Subplate

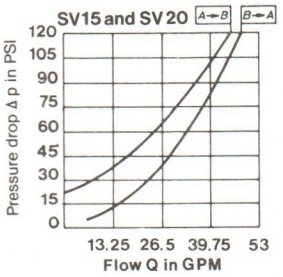
NPT Thread

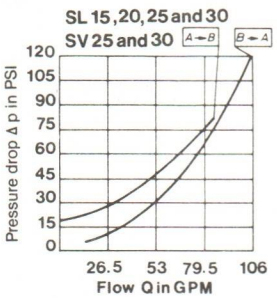
SEALS
- OMIT = Buna-N
- V = Viton

Performance Curves

(pressure drop Δ p related to flow Q)







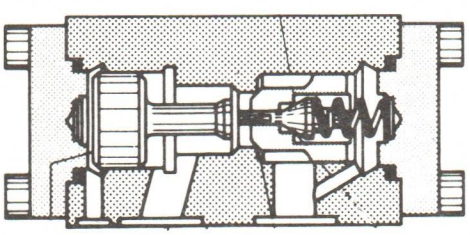
Technical Data

	SL/SV 10 (1/2")	SL/SV 15 (3/4")	SV 20 (1")	SL 20 (1")	SV/SL 25 (1 1/4")	SV/SL 30 (1 1/2")
Weight	5.5 lbs	8.8 lbs		17.6 lbs		
Direction of flow	free flow from A to B; from B to A after pilot operation					
Hydraulic medium	Mineral oils					
Fluid temperature range	– 4° to + 160° F					
Viscosity range	35 to 1750 SSU					
Max. operating pressure	4500 PSI					
Pilot pressure range	3 to 4500 PSI					

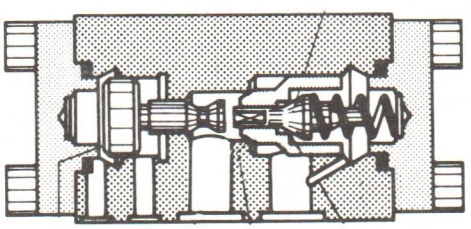
Pilot Volume	SL 10	SV 10	SV 15 and 20	SL 15, 20 25 and 30	SV 25 and 30
at port X	0.13 in³		0.53 in³	1.07 in³	
at port L	0.12 in³	—	—	0.86 in³	—

For applications to other specifications please consult factory.

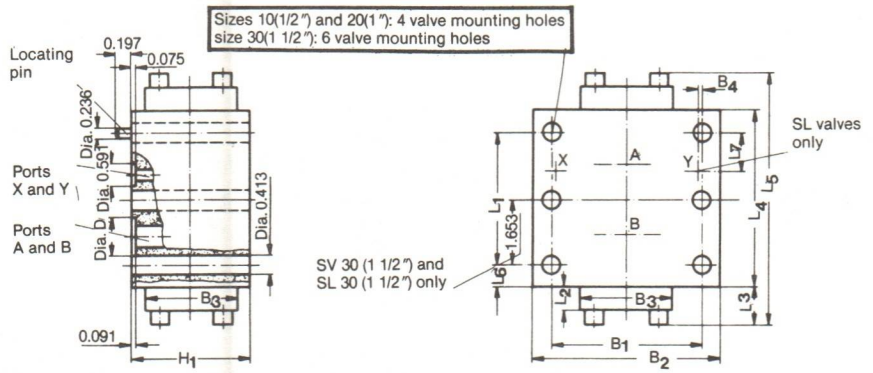
SV Valves



SL Valves

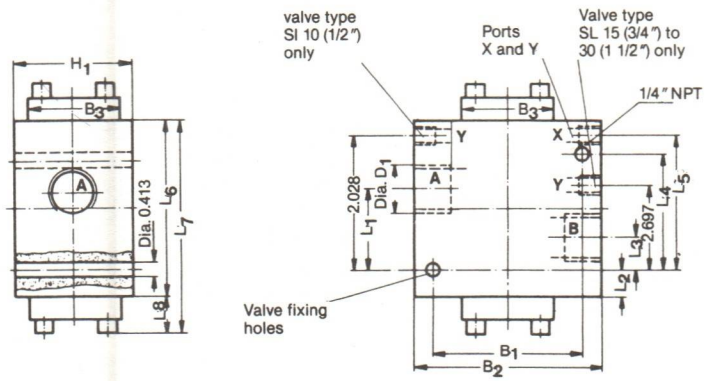


Unit Dimensions; Subplate mounting valve (dimensions in inches)

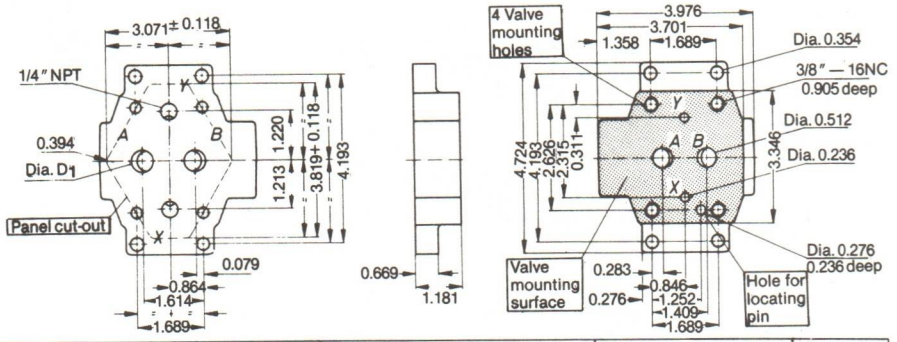


Type	Size	B_1	B_2	B_3	B_4	D_1	H_1	L_1	L_2	L_3	L_4	L_5	L_6	L_7
SV	10 (1/2")	2.618	3.346	1.575	—	0.827	1.653	1.693	0.394	0.709	3.150	4.567	0.782	—
	20 (1")	3.130	3.937	2.165	—	1.181	2.244	2.382	0.394	0.787	3.740	5.315	0.681	—
	30 (1 1/2")	3.819	4.724	2.756	—	1.575	2.953	3.307	0.669	1.142	4.528	6.811	0.610	—
SL	10 (1/2")	2.618	3.346	1.575	0.311	0.827	1.653	1.693	0.394	0.709	3.150	4.567	0.782	0.846
	30 (1 1/2")	3.819	4.724	2.756	0.150	1.575	2.953	3.307	0.669	1.142	4.921	7.205	0.610	2.342

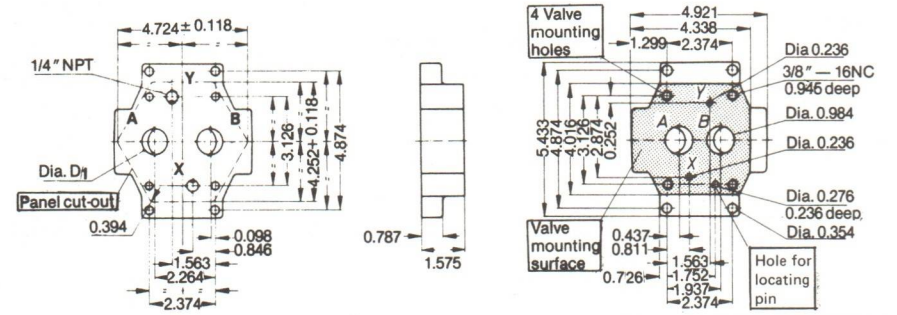
Unit Dimensions: Valve with threaded connections (dimensions in inches)



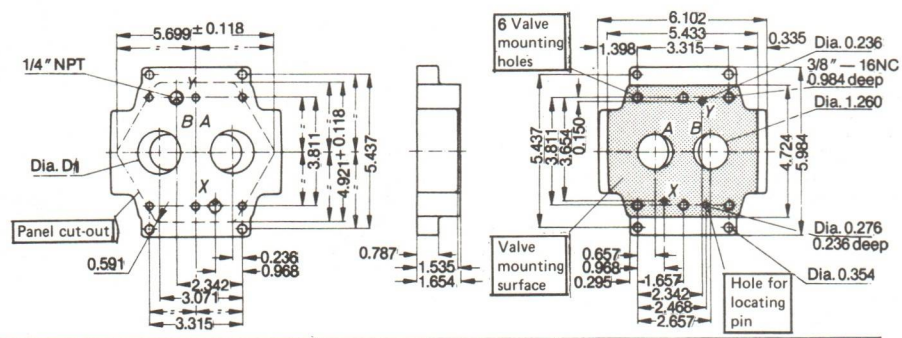
Type	Size	B_1	B_2	B_3	D_1	H_1	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8
SV	10 (1/2")	2.618	3.346	1.575	1/2" NPT	1.654	1.083	0.728	0.413	1.319	1.929	3.150	4.567	0.709
	15 (3/4")	3.130	3.937	2.165	3/4" NPT	2.244	1.145	0.681	0.524	1.988	2.657	3.740	5.315	0.787
	20 (1")	3.130	3.937	2.165	1" NPT	2.244	1.145	0.681	0.524	1.988	2.657	3.740	5.315	0.787
	25 (1-1/4")	3.819	4.724	2.756	1-1/4" NPT	2.953	2.146	0.610	0.807	2.894	3.524	4.528	6.811	1.142
	30 (1-1/2")	3.819	4.724	2.756	1-1/2" NPT	2.953	2.146	0.610	0.807	2.894	3.524	4.528	6.811	1.142
SL	10 (1/2")	2.618	3.346	1.575	1/2" NPT	0.827	0.886	0.728	0.413	1.319	1.929	3.150	4.567	0.709
	15 (3/4")	3.819	4.724	2.165	3/4" NPT	2.953	2.146	0.610	0.807	3.307	3.917	4.921	7.205	1.142
	20 (1")	3.819	4.724	2.165	1" NPT	2.953	2.146	0.610	0.807	3.307	3.917	4.921	7.205	1.142
	25 (1-1/4")	3.819	4.724	2.756	1-1/4" NPT	2.953	2.146	0.610	0.807	3.307	3.917	4.921	7.205	1.142
	30 (1-1/2")	3.819	4.724	2.756	1-1/2" NPT	2.953	2.146	0.610	0.807	3.307	3.917	4.921	7.205	1.142



Size	Subplate type	D1	Valve mounting screws	Tightening torque (ft-lb)	Weight (lbs)
10 (1/2")	G 460/5	3/8" NPT	(4) 3/8"—16NC x 2 1/4" (must be ordered separately)	50	3, 7
	G 461/5	1/2" NPT			



Size	Subplate type	D1	Valve mounting screws	Tightening torque (ft-lb)	Weight (lbs)
20 (1")	G 412/5	3/4" NPT	(4) 3/8"—16NC x 3" (must be ordered separately)	50	3, 7
	G 413/5				



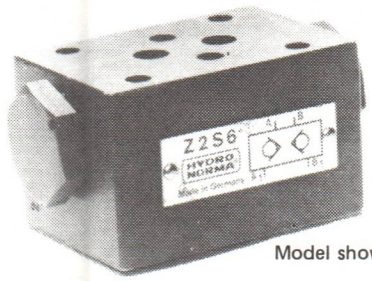
Size	Subplate type	D1	Valve mounting screws	Tightening torque (ft-lb)	Weight (lbs)
30 (1 1/2")	G 414/5	1 1/4" NPT	(4) 3/8"—16NC x 3 1/2" (must be ordered separately)	50	11
	G 415/5	1 1/2" NPT			

CheckValves

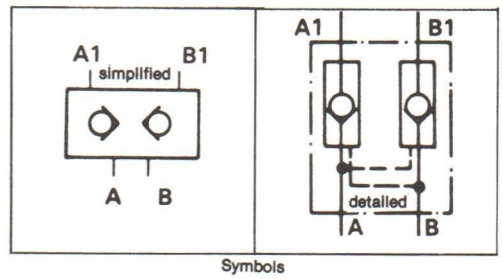
The Z2S series Check Valves are designed for sandwich type mounting with our directional control valves (sizes 6 to 22), and conform to ANSI Standards, D01-D06.

The basic design incorporates two main poppets, each with built-in decompression. The piloting piston is centered between the two poppets and is shifted in either the A or B consumer lines. Pressurization of the "A" port first opens the decompression poppet of "B" port followed by complete opening of the "B" main poppet, and visa-versa.

To provide positive closure of both poppets, the directional control valve should vent A & B ports to tank in neutral position.



Model shown is Z2S6



Symbols

Type Z2S Sizes 1/4" to 1"

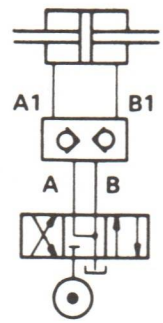
Flows to 75 GPM
5000 PSI

Ordering Code

Z2S 10 – XX

- 10 = SIZE
  - 6 = ANSI D01
  - 10 = ANSI D02
  - 16 = ANSI D04
  - 22 = ANSI D06
- XX = DESIGN SERIES

Example of Application



Technical Data

Refer to **RA 21545**

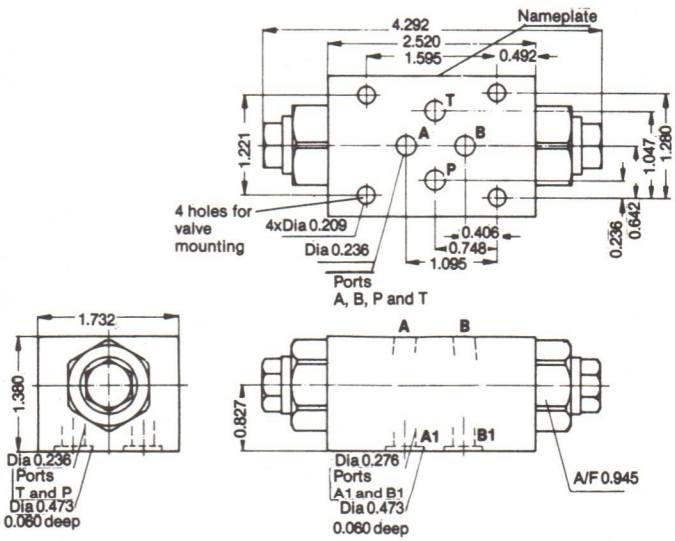
Z2S6 1/4" D01 Mount 5 GPM

Direction of Flow	From A to A1 or B to B1 free flow over check valve; controlled flow from B1 to B or A1 to A
Hydraulic medium	Mineral oils
Fluid temperature range	– 4 to + 160° F
Viscosity range	35 to 1750 SSU

Operating pressure range	up to 5000 PSI
Cracking pressure in free flow direction	7 PSI
Area Ratio	$\frac{\text{poppet}}{\text{control spool}} = \frac{1}{2.7}$

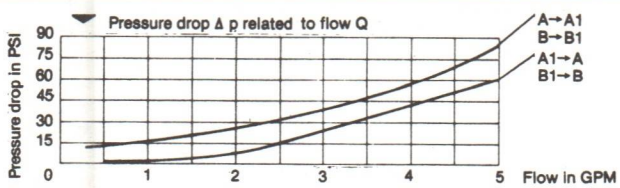
Unit dimensions (in inches)

Weight: approx. 1.8 LBS



Performance Curves

Z2S6



Data

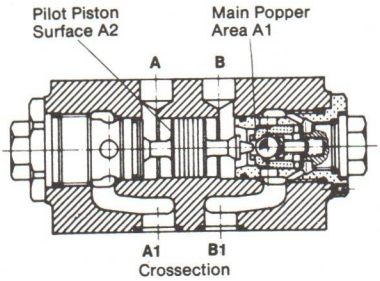
Refer to **RA 21550**

Z2S10 1/2" DO2 Mount 20GPM

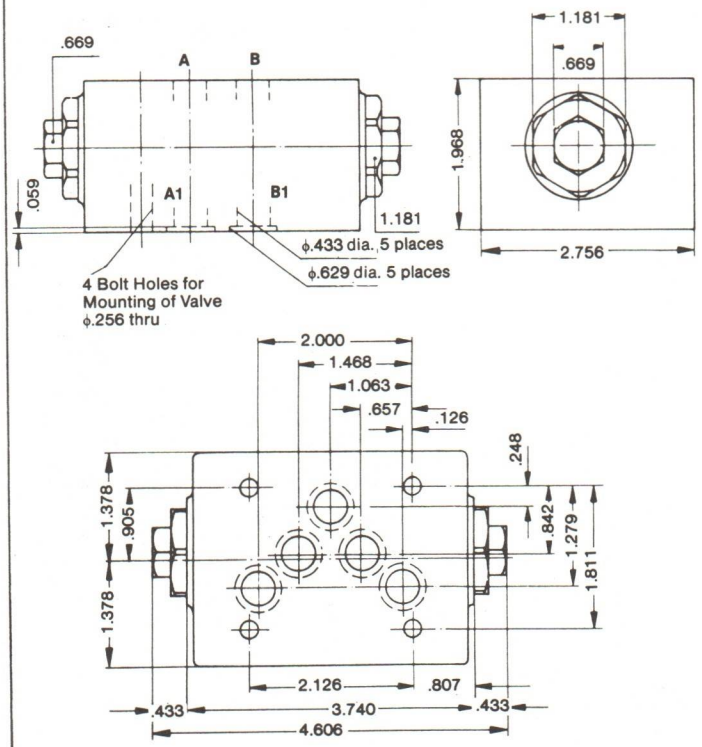
Direction of Flow	From A to A1 or B to B1 free flow through check valve; after opening from B1 to B or A1 to A
Pressure Fluid	Mineral Oil
Hydraulic Fluid Temperature Range	−4 to 160°F
Viscosity Range	35 to 1750 SSU

Operation Pressure Range	Up to 5000 PSI
Cracking Pressure in free direction	7 PSI
Area Ratio	Main Poppet / Pilot Piston (see sectional drawing) = A1/A2 = 1/2.78

For application to other specifications please consult us.

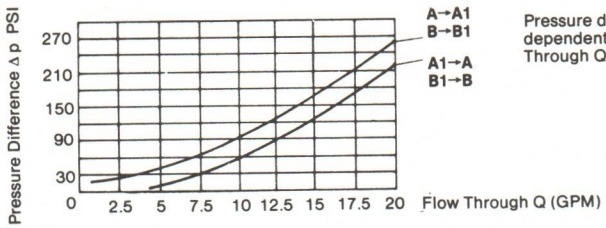


Dimensions: (dimensions in inches) Weight, 4.4 lbs.



Characteristic Curve (measured by v = 172.2 SSU and t = 122°F)

Z2S10



Pressure drop (p) dependent on Flow Through Q

Technical Data

Refer to **RA 21554**

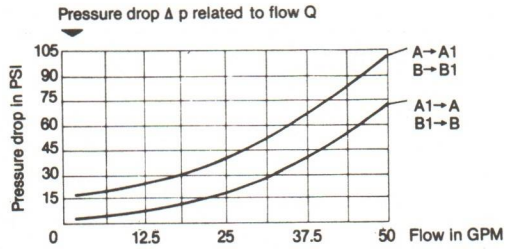
Z2S16 3/4" DO4 Mount 50 GPM

Direction of Flow	From A to A1 or B to B1 free flow over check valve; controlled flow from B1 to B or A1 to A
Hydraulic medium	Mineral oils
Fluid temperature range	− 4 to + 160° F
Viscosity range	35 to 1750 SSU

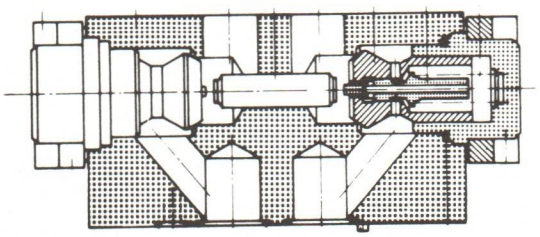
See next page for dimensional data on Z2S16.

Operating pressure range	up to 5000 PSI
Cracking pressure in free flow direction	15 PSI
Area ratio	pilot poppet / control spool = 1/4

Performance Curves



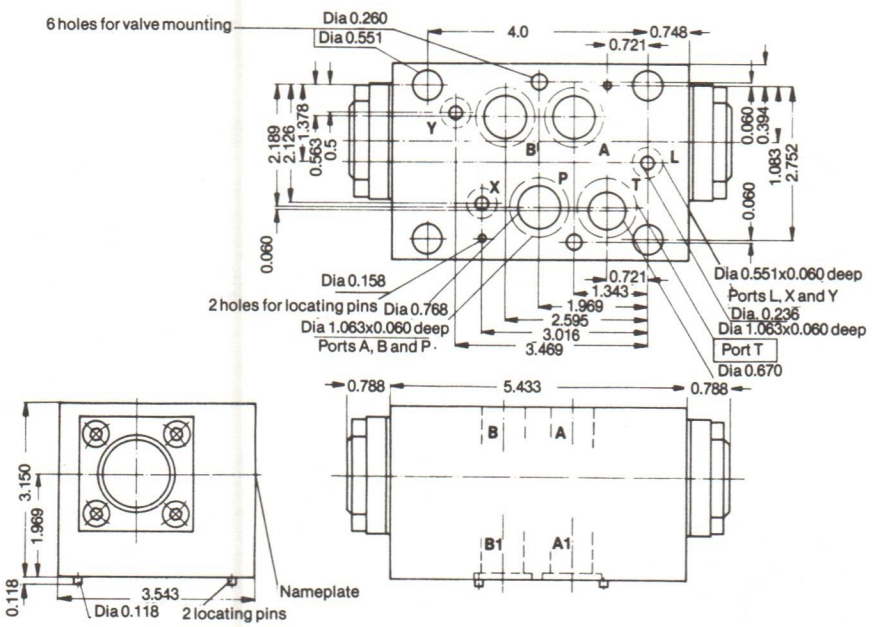
Z2S16



Unit dimensions (in inches)

Weight: approx. 25.8 LBS

Z2S16



Technical Data

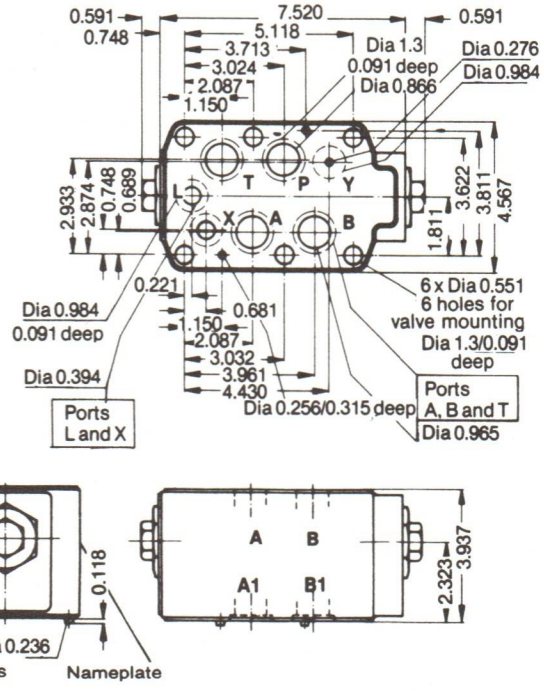
Z2S22 1" DO6 Mount 75 GPM

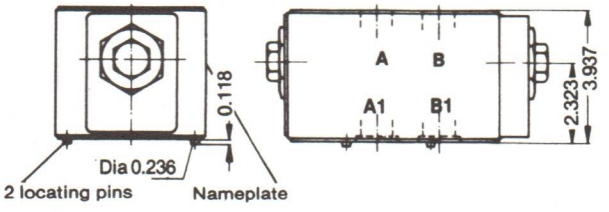
Refer to **RA 21560**

Direction of Flow	From A to A1 or B to B1 free flow over check valve; controlled flow from B1 to B or A1 to A
Hydraulic medium	Mineral oil
Fluid temperature range	– 4 to + 160 ° F
Viscosity range	35 to 1750 SSU

Operating pressure range	up to 5000 PSI	
Cracking pressure in free flow direction	15 PSI	
Area ratio	$\frac{\text{pilot poppet}}{\text{control spool}}$	$= \frac{1}{12.3}$
	$\frac{\text{pilot poppet}}{\text{control spool}}$	$= \frac{1}{2.78}$

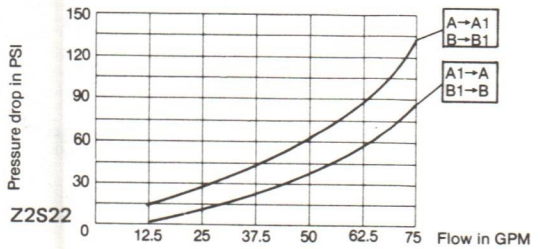
For applications to other specifications please consult us.





Performance Curves

Pressure drop Δ p related to flow Q



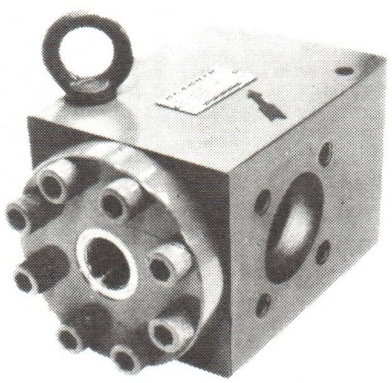
CheckValves

SV/SL Pilot Operated Sizes 52(2") to 150(6")

Maximum Pressure 5000 PSI (315 BAR) Flows to 1,700 GPM

S Type Sizes 52(2") to 150(6")

Maximum Pressure 5000 PSI (315 BAR) Flows to 3,963 GPM



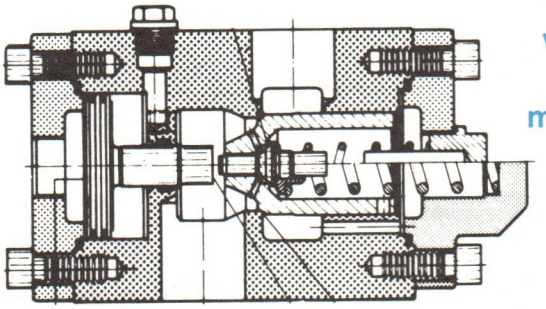
SV/SL

MOUNTING
Sizes 52 to 82 - Manifold
Sizes 52 to 150 - Flanged

Refer to **RE 21482**

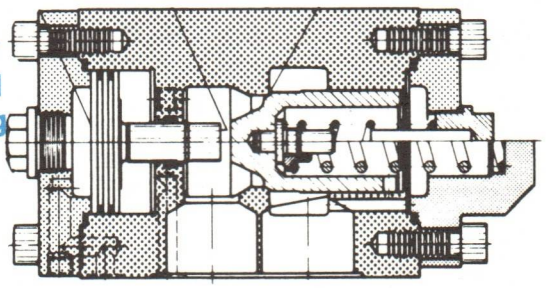
The Pilot Operated Check Valves type SV and SL are hydraulically piloted to open with built-in decompression poppets, allowing leak free closure in one direction (B to A) until a pilot signal is introduced and free flow in the opposite direction (A to B).

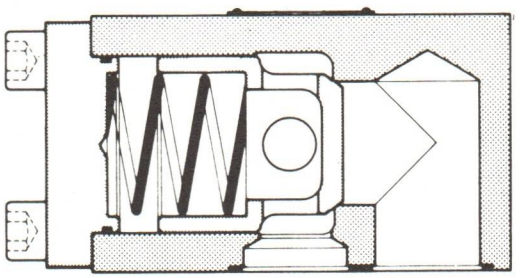
SV type has an internal drain
SL type has an external drain



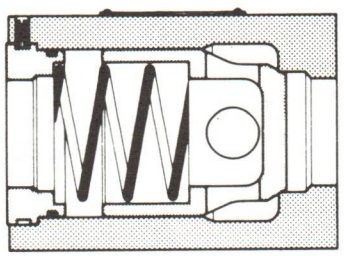
valve for flange mounting

valve for manifold mounting

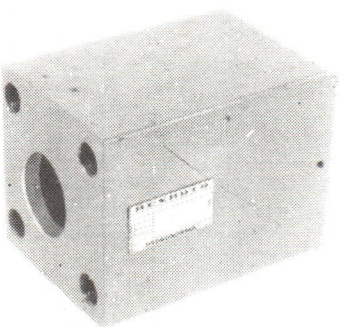




valve for manifold mounting



valve for flange mounting



S Type

MOUNTING
Manifold sizes 52 to 82
Flanged sizes 52 to 150

Refer to **RE 20392**

The check valves type S serve to give leakfree closure in one direction and free return flow in the other.

The stroke of the poppet at the external diameter is limited by a stop. The built-in spring supports the closing movement and also serves to hold the valve poppet in the closed position.

Four variations are available
– cracking pressures of 7 psi (0.5 bar) for sizes 52 to 150
– cracking pressures of 22 psi (1.5 bar) for sizes 52 to 102
– cracking pressures of 43.5 psi (3 bar) for sizes 52 to 82
– without a spring for sizes 52 to 150

For mounting in manifold blocks the check valve is available as a straight or angled valve cartridge. (Sizes 52 to 150)

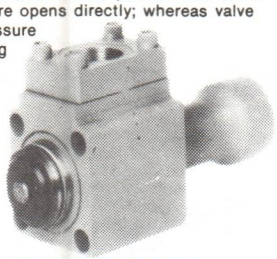
Prefill Valves

The prefill valves, type SF, are pilot operated check valves. They have free flow in the direction A to B and close without leakage in the opposite direction (B to A).

The valves are opened hydraulically by pressurizing pilot piston thru port X. The main poppet of valve model without decompression feature opens directly; whereas valve model with decompression feature, the pilot pressure breaker opens prior to main poppet, thus allowing a rapid and smooth system flow.

Opening and closing times can be controlled by installing a throttle/check valve in the pilot pressure line.

The pilot piston and check valve sections are designed as cartridge units which allow interchangeability with the basic valve housing for each size, as well as allowing mounting of check valve section (without housing) directly into installation cavity provided by customer.

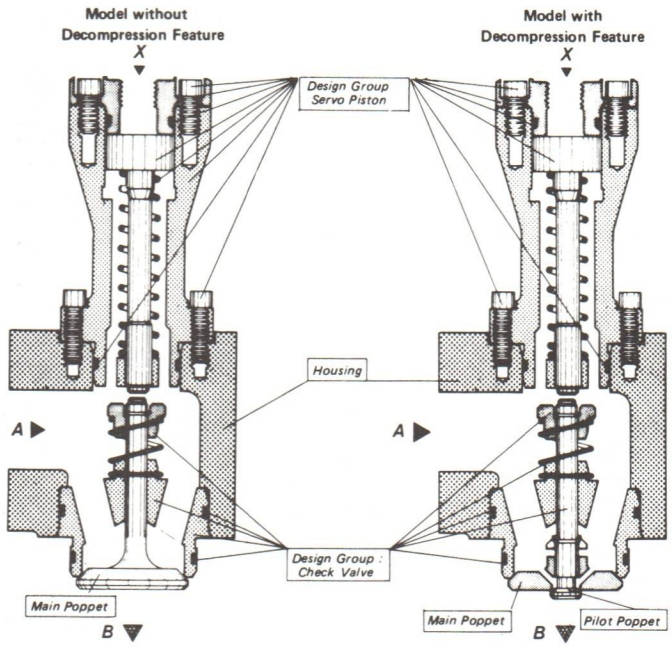


to 320 GPM
5000 PSI

Thus, the following variations are possible:

—complete valve (pilot piston section, housing and check valve section) for direct mounting to cylinder.
—check valve section only for usage as an anti-cavatation valve
—cartridge unit (pilot piston and check valve sections) for mounting directly to cylinder cap.

Note: Prefill valve with decompression feature is preferable.



Type SF Sizes 2" to 3 1/2"

Refer to **RA 20475**

Ordering Code (Connection flange and flange mounting screws to be ordered separately)

SF 63 A 1 – 1 – XX/V

SIZE
40 = 2"
50 = 2-1/2"
63 = 3"
80 = 3-1/2"
100 = 4"
125 = 5"
150 = 6"
200 = 8"
250 = 10"
300 = 12"
350 = 14"

CONNECTIONS
A = Flanged (all sizes)
B = Tank mounted (size 100 thru 350 only)

1 = W/decompression
0 = Without decompression (size 40 thru 80 only)

1 = 3 PSI cracking

DESIGN SERIES

SEALS
OMIT = Buna-N
V = Viton

Technical Data

Port	A	B	X
Operating pressure range	up to 240 PSI	up to 5000 PSI	up to 5000 PSI
Cracking pressure	3 PSI		
Hydraulic medium	Mineral oil		
Fluid temperature range	-25 to +180°F		
Viscosity range	35 to 1750 SSU		

For applications to other specifications please consult us.

NOTE: Data presented is for sizes 2" through 3-1/2" (Models SF 40, 50, 63 & 80) see next page for larger sizes.

Flow (GPM) related to flow velocity

(ft/s)	Size 40(2")	Size 50(2-1/2")	Size 63(3")	Size 80(3-1/2")
1.65	10.0	15.5	25.0	40.0
3.3	20.0	31.0	50.0	80.0
4.95	30.0	46.5	75.0	120.0
6.6	40.0	62.0	100.0	160.0
8.25	50.0	77.5	125.0	200.0
9.9	60.0	93.0	134.0	240.0
11.55	70.0	108.5	175.0	280.0
13.2	80.0	124.0	200.0	320.0

Prefill Valves

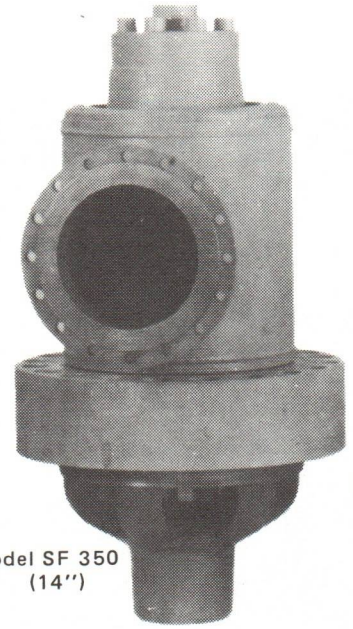
The prefill valves, Type SF, are pilot operated check valves. They have free flow in the direction A to B and close without leakage in the opposite direction (B to A).

The valves are opened hydraulically by pressurizing the pilot piston through port X. A pilot pressure breaker is built into the main poppet for load decompression. The pressure breaker opens before the main poppet allowing smooth system flow. Opening and closing time of the main poppet can be controlled by installing a throttle check valve in the pilot line.

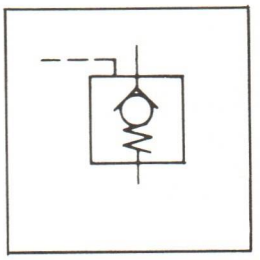
On valve Type A (flange connections) the housing can be rotated 360°.

The valves are designed so that all three types (A, B & K) can be obtained from the same basic model.

To indicate open position of valve, a limit switch can be installed at pilot piston.



Model SF 350
(14")

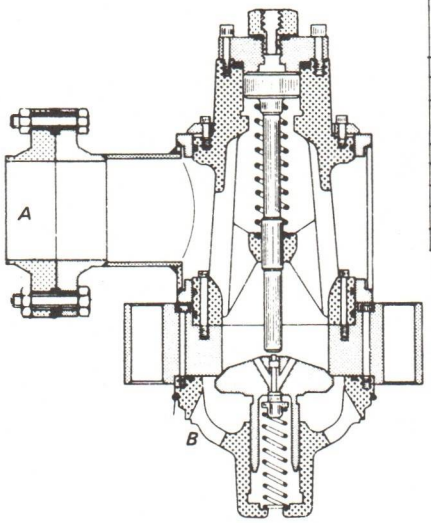


up to 6136 GPM
5000 PSI

Refer to **RA 20481**

Type SF Sizes 4" to 14"

Technical Data



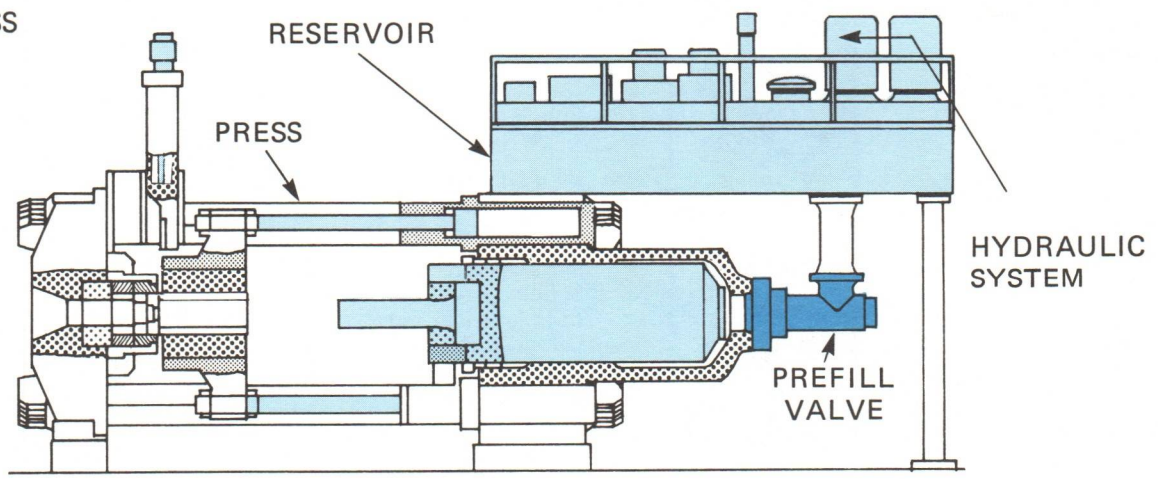
Pipe connection: Model A Welding neck flange(DIN2633)	Size 100 4"	Size 125 5"	Size 150 6"	Size 200 8"	Size 250 10"	Size 300 12"	Size 350 14"
Models B and K	Tank mounting						
Port X (Models A and B only)	3/4" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/4" NPT	1-1/2" NPT	1-1/2" NPT
Operating pressure range	Port A up to 225 PSI		Port B up to 5000 PSI		Port X up to 5000 PSI		
Cracking pressure	3 PSI						
Hydraulic medium	Mineral oil						
Fluid temperature range	-25 to +180°F						
Viscosity range	35 to 1750 SSU						
Mounting position	Optional						

(For applications to other specifications please consult us!)

Flow related of flow velocity (GPM)

V (ft/s)	Size 100(4")	Size 125(5")	Size 150(6")	Size 200(8")	Size 250(10")	Size 300(12")	Size 350(14")
1.65	62	98	140	251	397	556	767
3.3	124	196	289	500	794	1112	1534
4.95	186	294	420	750	1191	1668	2301
6.6	248	392	560	1004	1592	2224	3068
8.25	310	490	700	1255	1989	2780	3835
9.9	372	588	840	1506	2382	3336	4602
11.55	434	686	980	1757	2779	3892	5369
13.2	496	784	1120	2008	3176	4448	6136

EXTRUSION PRESS



Summary | PRESSURE CONTROLS

TYPE	REXROTH CODE	DESIGN	SIZE/CAPABILITY	PAGE NO.
RELIEF VALVE	DBD	Direct Operated Subplate, In-Line (NPT) & Cartridge (Metric)	1/4" thru 1-1/2" up to 78 GPM 9000 PSI	4-1 & 4-2
	DB/DBW (Series 30)	Pilot Operated Subplate (ANSI) & In-Line (NPT)	1/2" thru 1-1/2" up to 160 GPM 5000 PSI	4-3 to 4-5
	DB/DBW (Series 40)	Pilot Operated Subplate (ANSI) In-Line (NPT) and Cartridge (Metric)	1/2" thru 1" up to 80 GPM 5000 PSI	4-6 to 4-8
	DBK	Pilot Operated Cartridge (Metric)	1/4" and 1/2" up to 26 GPM 5000 PSI	4-9
	ZDB/Z2DB	Pilot Operated Sandwich (ANSI)	1/4" and 1/2" up to 26 GPM/Pilot	4-10 & 4-11
	DBE/DBEM	Electrically Proportional Control Subplate (ANSI)	1/2" thru 1-1/2" up to 159 GPM 5000 PSI	4-12 to 4-14
DUAL RELIEF VALVE	DU	Direct Operated In-Line (NPT)	3/4" up to 9.3 GPM/9000 PSI HP Side and 33 GPM/1500 PSI LP Side	4-15
RELIEF VALVE	DB/DBW	Pilot Operated Flanged or Manifold	2-1/2" and 3-1/2" up to 925 GPM 5000 PSI	4-16
3–STAGE RELIEF VALVE	DB3U	Pilot Operated Subplate (ANSI)	1/2" thru 1-1/2" up to 159 GPM 5000 PSI	4-16
MULTI-FUNCTION PRESSURE CONTROL (SEQUENCE, COUNTER-BALANCE OR UNLOADING)	DZDP	Direct Operated Subplate (ANSI)	1/4" and 1/2" up to 12 GPM 3000 PSI	4-17 to 4-19
	DZ	Pilot Operated Subplate (ANSI)	1/2" thru 1-1/2" up to 119 GPM 3000 PSI	4-20 to 4-22
ACCUMULATOR UNLOADING VALVE	DA/DAW	Pilot Operated Subplate (ANSI)	1/2" thru 1-1/2" up to 65 GPM 4500 PSI	4-23 to 4-25
PRESSURE REDUCING VALVE	DRDP	Direct Operated Subplate (ANSI)	1/4" and 1/2" up to 12 GPM 3000 PSI	4-26 to 4-28
	DR (Series 30)	Pilot Operated Subplate (ANSI)	1/2" thru 1-1/2" up to 79 GPM 4500 PSI	4-29 & 4-30
	DR (Series 40)	Pilot Operated Subplate (ANSI) In-Line (NPT) and Cartridge (Metric)	1/2" thru 1" up to 42 GPM 4500 PSI	4-31 & 4-32
	ZDR	Direct Operated Sandwich (ANSI)	1/4" and 1/2" up to 12 GPM 4500 PSI	4-33 to 4-35

Pressure Controls

Direct Operated Pressure Relief Valve

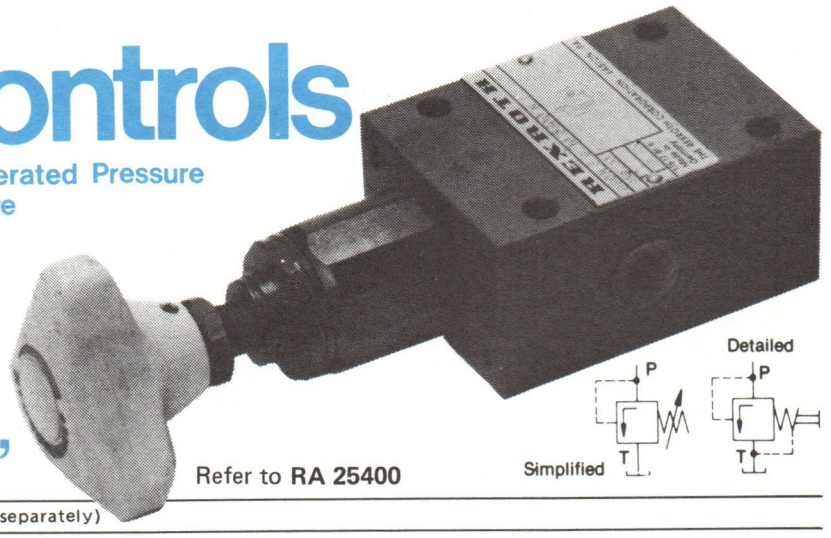
The DBD pressure relief valves are directly operated. They are available in 7 pressure ranges, variable up to 375, 750, 1500, 3000, 4500, 6000 and 9000 PSI.

Pressure adjustment can be performed by a set screw (with protective cap), a handknob, or a lockable handknob (with scale for repeat settings).

The DBD pressure relief valves are designed as cartridge inserts, subplate or manifold mounted units and as valves with threaded connections.

78 GPM 9000 PSI

Type DBD
Sizes 6-1/4" to 30-1 1/2"



Refer to **RA 25400**

Ordering Code (Subplate and mounting screws to be ordered separately)

DBD S 10 G XX/400 V/5

ADJUSTMENTS
- H = Handwheel
- S = Screw w/protective cap
- A = Tamperproof key lock

SIZE
- 6 = 1/4"
- 10 = 1/2"
- 15 = 3/4" (Code 'G' only)
- 20 = 1"
- 25 = 1-1/4" (Code 'G' only)
- 30 = 1-1/2"

MOUNTING
- G = Threaded body (NPT)
- P = Subplate
- K = Cartridge

DESIGN SERIES

MAX. OPERATING PRESSURE
- 25 = 325 PSI
- 50 = 750 PSI
- 100 = 1500 PSI
- 200 = 3000 PSI
- 315 = 4500 PSI
- 400 = 6000 PSI (Sizes 6,10,15 & 20 only)
- 630 = 9000 PSI (Size 10 only)

SEALS
- OMIT = Buna-N
- V = Viton

(NOT USED WITH CODE "K")

Technical Data

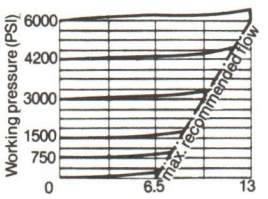
Viscosity Range	35 to 1750 SSU		
Max. Working Pressure - inlet side	Size 10 (1/2")	Size 6 to 20 (1/4" to 1")	Size 30 (1 1/2")
	9000 PSI	6000 PSI	4500 PSI

Design	Poppet Valve
Hydraulic Medium	Mineral Oil
Fluid Temperature Range	– 4.0 to + 160 °F

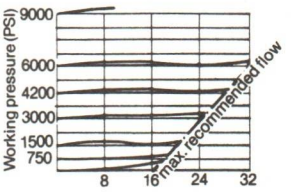
For applications to other specifications please consult us

Performance Curves

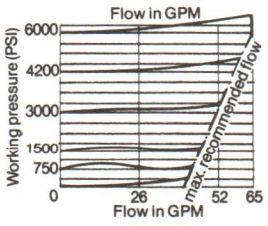
SIZE 6(1/4")



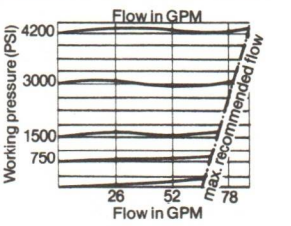
SIZE 10(1/2")



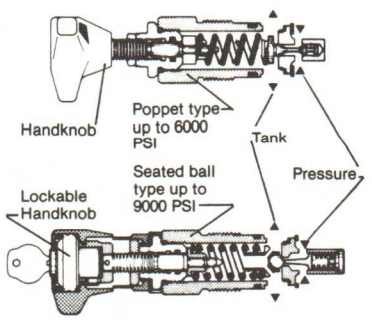
SIZE 15(3/4") & 20(1")



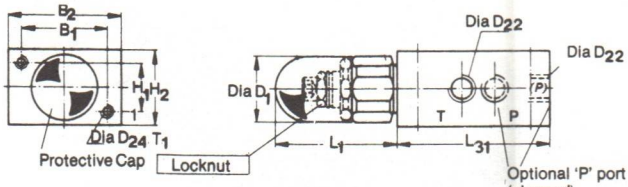
SIZE 25(1-1/4") & 30(1-1/2")

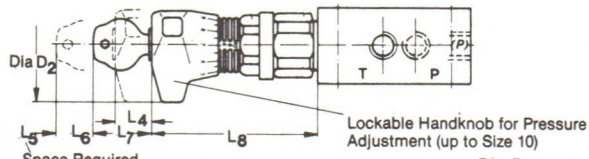


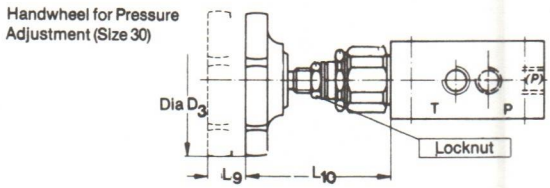
Section

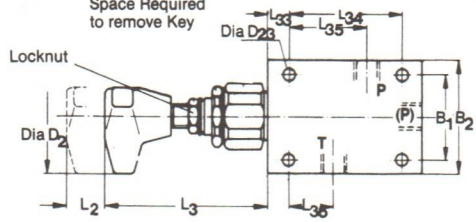


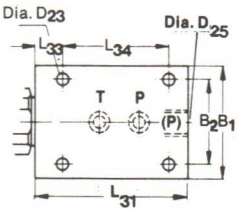
DBD, Threaded & Subplated





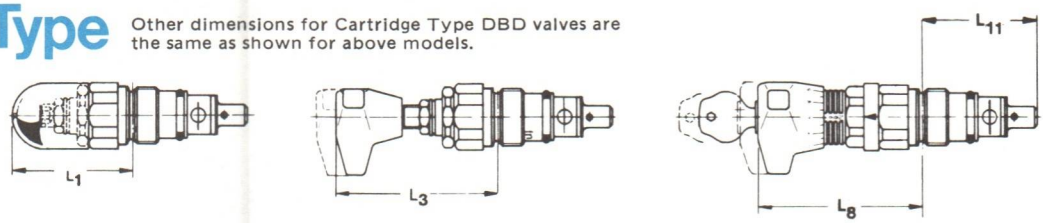






Cartridge Type

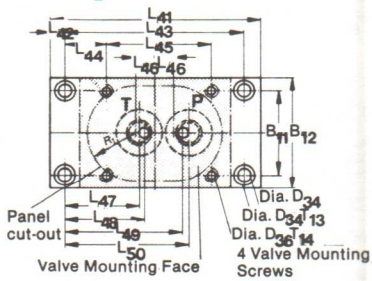
Other dimensions for Cartridge Type DBD valves are the same as shown for above models.

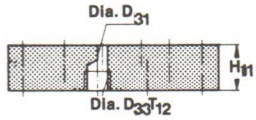


Size	Appr. Wt.	*B1	*B2	D1	D2	D3	D23	D28	H1	H2	L1	L2	L3	L4
6(1/4")	3.3 lbs	2.363	1.772	1.339	2.363		0.260	1/4"–20/NC	0.985	1.575	2.835		3.268	0.433
10(1/2")	8.2 lbs	3.150	2.363	1.496	0.355		0.355	5/16"–18/NC	1.575	2.362	2.677	0.433	3.110	
15(3/4") 20(1")	14.1 lbs	3.937	2.758	1.890					1.969	2.756	2.560		3.032	
25(1-1/4") 30(1-1/2")	30.6 lbs	5.118	3.937	2.480		3.150	0.433	3/8"–16/NC	2.362	3.543	3.268			

Size	Appr. Wt.	L5	L6	L7	L8	L9	L10	**L11	L31	D25	L33	L34	T1
6(1/4")	3.3 lbs	0.785		1.181	3.268			2.496	3.150	1/4"NPT	0.591	2.168	0.394
10(1/2")	8.2 lbs		0.433		3.110			2.925	3.937	1/2"NPT	0.788	2.756	0.785
15(3/4") 20(1")	14.1 lbs							4.174	5.315	3/4"NPT 1"NPT		3.937	
25(1-1/4") 30(1-1/2")	30.6 lbs					0.433	2.205	5.158	7.087	1-1/4"NPT 1-1/2"NPT	0.985	5.118	0.985

DBD Subplate





Valve mounting screws		Tight Torque
Size 6 (1/4")	1/4"—20 NC	7.3 (ft-lb)
Size 10 (1/2")	5/16"—18 NC	18.2 (ft-lb)
Size 20 (1")	5/16"—18 NC	
Size 30 (1 1/2")	3/8"—16 NC	36.4 (ft-lb)

Subplate	Type	Appr. Wt.	B11	B12	D31	D33	D34	D35	D36(NC)	H11	L41	L42	L43
6(1/4")	G 300/5	3.3 lbs	1.771	2.362	0.237	1/4"NPT	0.276	0.433	1/4"–20	0.985	4.331	0.315	3.701
10(1/2")	G 302/5	4.4 lbs	2.362	3.150	0.394	1/2"NPT			5/16"–18		5.315	0.394	4.528
20(1")	G 304/5	12.1 lbs	2.758	3.937	0.788	1"NPT	0.453	0.689		1.575	6.693	0.591	5.512
30(1-1/2")	G 306/5	17.6 lbs	3.937	5.118	1.181	1-1/2"NPT			3/8"–16		7.481	0.492	6.496

Subplate	Type	Appr. Wt.	L44	L45	L46	L47	L48	L49	L50	T12	T13	T14	R1
6(1/4")	G 300/5	3.3 lbs	0.866	2.166	0.394	1.536	1.654	2.441	2.560	0.591	0.355	0.591	0.986+0.079
10(1/2")	G 302/5	4.4 lbs	1.083	2.756		1.595	1.910	2.855	3.170	0.630	0.355		
20(1")	G 304/5	12.1 lbs	0.785	3.937	0.788	1.654	2.126	3.347	3.819	0.788	0.512	0.866	1.575+0.118
30(1-1/2")	G 306/5	17.6 lbs	0.689	5.118	0.886	1.654	2.067	4.036	4.607	0.945	0.453	0.866	2.166+0.156

Pressure Controls

The valve type DB and DBW are pilot operated poppet type pressure relief valves.
They serve to limit (DB) or to limit and unload (DBW) the pressure in a hydraulic system.

Pressure Relief Type DB

System pressure acts on the main spool. At the same time pressure acts, via a pilot line fitted with orifices, on the spring loaded side of the main spool and on the pilot poppet. If system pressure exceeds the value set with the spring, the pilot poppet opens, and pilot oil is allowed to flow back to tank. The orifices combination causes a pressure drop at the main spool. This is lifted from its seat and opens the connection pump to tank.

Pressure Relieve Valve Type DBW

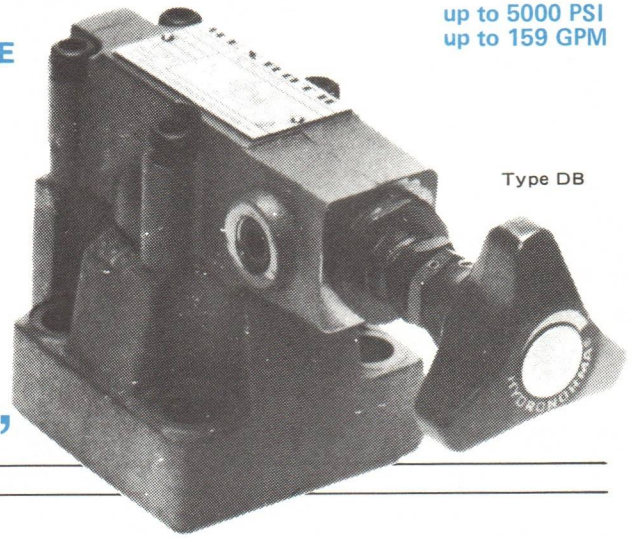
By mounting a directional control valve size 5 (1/8") on the relief valve it may then be used for unloading. In this case the pressure drop at the main spool is obtained by actuating the directional control valve.

PILOT OPERATED PRESSURE RELIEF VALVE

Design Features:
- —subplate mounting
- —cast oil passages
- —solenoid unloading
- —3 types of adjustment:
  - handknob
  - set screw with protective cap
  - lockable handknob

Refer to **RA 25809**

up to 5000 PSI
up to 159 GPM



Type DB

Type DB Size 10 - 1/2 to 30 - 1 1/2"

Ordering Code, Subplates and Bolt Kit to be ordered separately

DB W OMIT 30 B G 2 – XX / 315 Y U 5AW120–60NZ4 V / 5

SOLENOID CONTROL
- Omit = If not required
- W = Solenoid venting

OMIT = Complete valve
- T = Remote valve only
- C = Pilot valve only Size 10 - 30 only
- C + Size = Pilot valve & cartridge

SIZE
- 10 = 1/2"
- 15 = 3/4" (Code "G" only)
- 20 = 1" (ANSI R06)
- 25 = 1-1/4" (Code "G" only)
- 30 = 1-1/2" (ANSI R10)

DBW ONLY
- A = Normally closed
- B = Normally open

MOUNTING
- Omit = Subplate Size 10 - 30
- G = Threaded body (NPT)

ADJUSTMENT
- 1 = Hand
- 2 = Screw w/protective cap
- 3 = Key lock

DESIGN SERIES

OPTIONS

VENT PRESSURE

DBW ONLY

MAXIMUM OPERATING PRESSURE
- 100 = 1500 PSI
- 315 = 4500 PSI

OMIT = Int. pilot - int. drain
- X = Ext. pilot - int. drain
- Y = Int. pilot - ext. drain
- XY = Ext. pilot - ext. drain

U = 45 PSI (std.)

G + VOLTAGE = DC
- W + Voltage + Frequency = AC
- N = Manual override
- Z4 = Small plug in connector
- Z5L = Large plug in connector w/indicator lights

Size 10 - 30 only

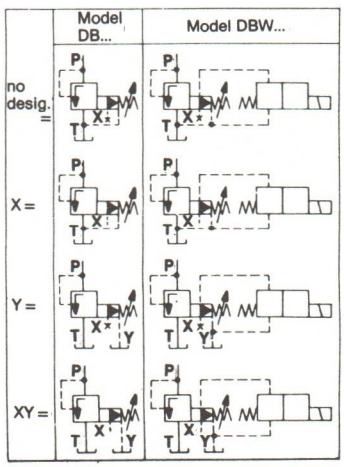
SEALS
- Omit = Buna-N
- V = Viton

Technical Data

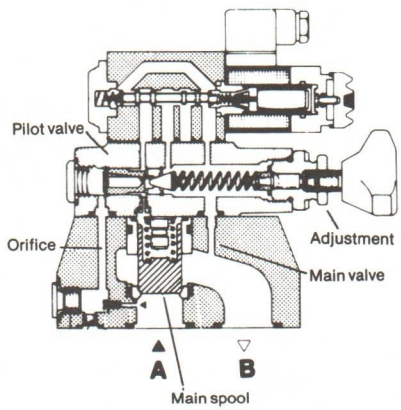
Hydraulic medium	Mineral oils
Fluid temperature range	– 4 to + 160 °F
Viscosity range	35 to 1750 SSU
Max. operating pressure (ports P, T and X)	5000 PSI
Max. back pressure (port Y)	4500 PSI
Min. pressure setting (Q-dependent)	see performance curves

Max. pressure setting			5000 PSI		
Max. flow rating (GPM)	Size 10 (1/2")	Size 15 (3/4")	Size 20 (1")	Size 25 (1 1/4")	Size 30 (1 1/2")
	53	53	106	106	159
Operating pressure range (directional control valve)	max. 3500 PSI				

Pilot oil connection



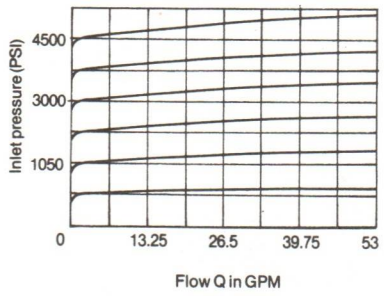
Section



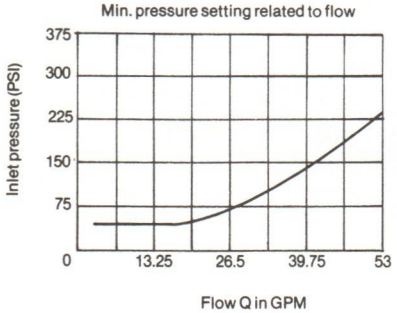
Performance Data

Note: The inlet pressure is always increased by the amount of back pressure at port T or Y.

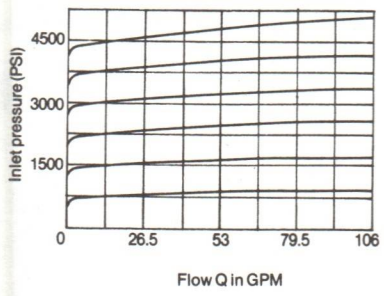
Operating pressure related to flow

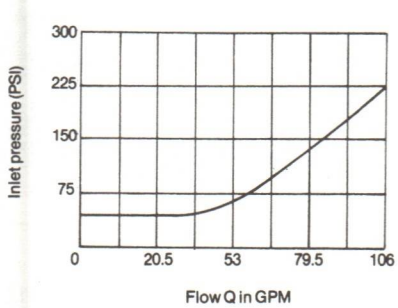


Min. pressure setting related to flow

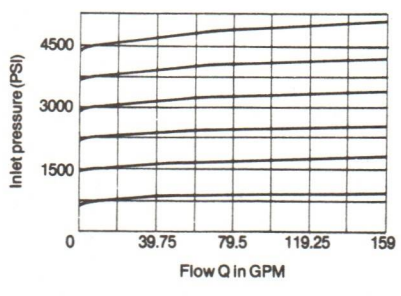


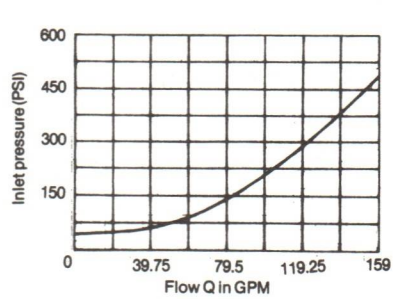
Size 10(1/2")





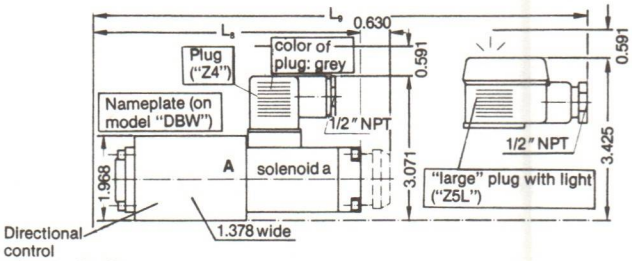
Size 20(1")

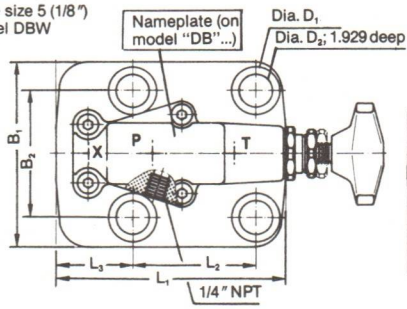




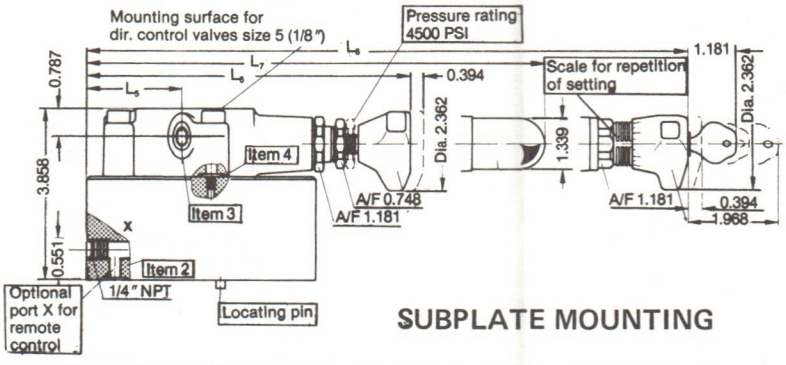
Size 30(1-1/2")

Unit Dimensions: relief valve for subplate mounting (dimensions in inches)





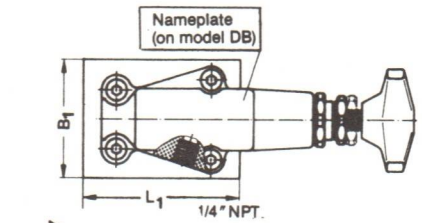
Valve	Weight (lbs) DB...	Weight (lbs) DBW...
Size 10 (1/2")	10.6	13.0
Size 15 (3/4")		
Size 20 (1")	10.1	12.5
Size 25 (1 1/4")	12.3	14.5
Size 30 (1 1/2")	11.7	14.1

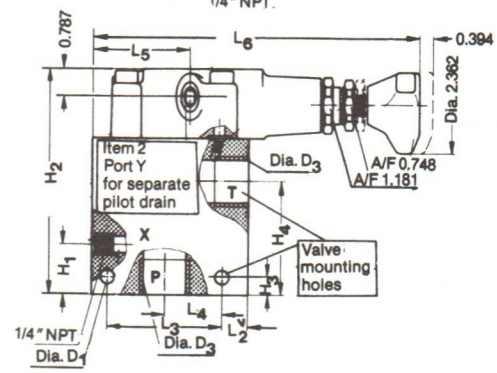


SUBPLATE MOUNTING

Valve	B_1	B_2	B_3	D_1	D_2	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9	Weight (lbs) DB...	Weight (lbs) DBW...
Size 10 (1/2")	3.346	2.126	3.346	0.787	0.551	3.543	2.126	0.866	3.937	1.850	6.732	6.142	5.394	5.630	7.7	10.1
Size 20 (1")	4.016	2.756	4.016	1.024	0.709	4.882	2.638	1.614	5.039	2.165	7.047	6.457	5.709	5.945	10.3	12.8
Size 30 (1 1/2")	4.724	3.248	4.724	1.142	0.787	6.142	3.504	1.850	6.220	2.480	7.362	6.772	6.024	6.260	14.5	16.9

Unit Dimensions: relief valve with threaded connections (dimensions in inches)



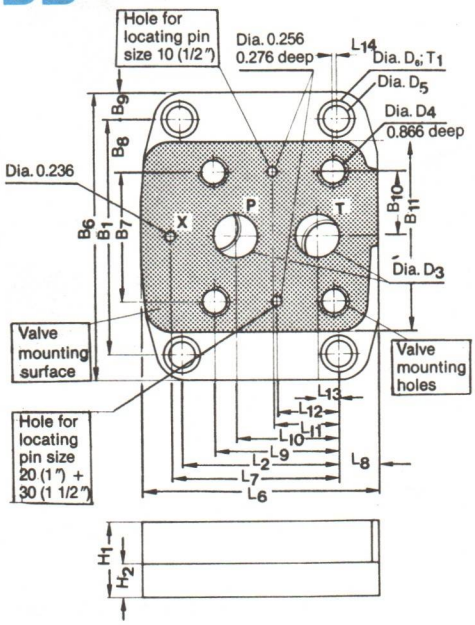


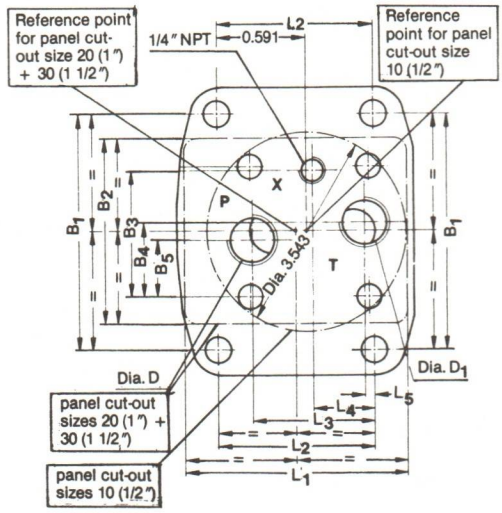
THREADED MOUNTING

Valve	B_1	D_1	D_3	H_1	H_2	H_3
Size 10 (1/2")	2.480	0.330	1/2" NPT	1.063	4.921	0.394
Size 15 (3/4")			3/4" NPT			
Size 20 (1")			1" NPT			
Size 25 (1 1/4")	2.756	0.394	1 1/4" NPT	1.653	5.433	0.512
Size 30 (1 1/2")			1 1/2" NPT			

Valve	H_4	L_1	L_2	L_3	L_4	L_5	L_6
Size 10 (1/2")	2.244	3.346	0.551	2.441	1.220	1.811	6.693
Size 15 (3/4")							
Size 20 (1")							
Size 25 (1 1/4")	2.520	3.937	0.709	2.835	1.417	2.047	6.929
Size 30 (1 1/2")							

TypeDB

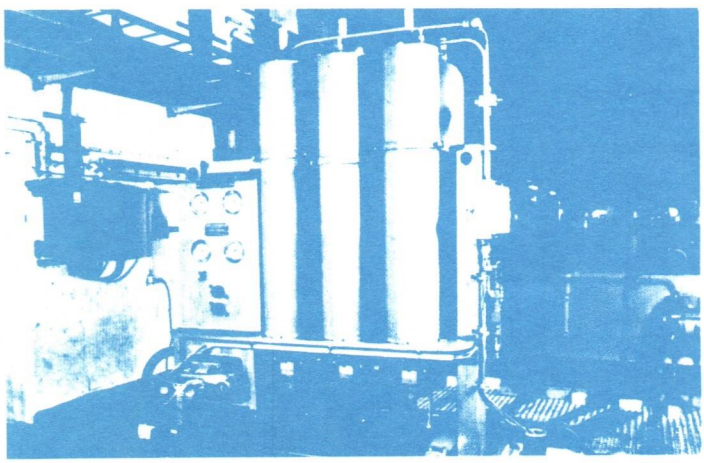


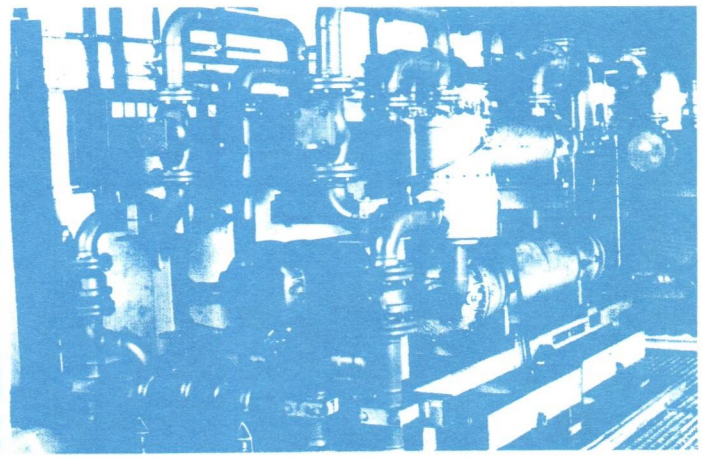


Size	10 (1/2")		20 (1")		30 (1 1/2")	
Part No.	G406/5	G407/5	G408/5	G409/5	G410/5	G411/5
Weight (lbs)	4.0	4.0	8.0	8.0	12.8	12.8
B_1	4.193		5.000		5.748	
B_2	—		3.937		4.724	
B_3	2.067		2.756		3.386	
B_4	1.260		1.378		1.626	
B_5	0.866		1.378		1.626	
B_6	5.118		6.063		6.850	
B_7	2.126		2.756		3.248	
B_8	1.031		1.122		1.252	
B_9	0.465		0.531		0.547	
B_{10}	1.063		1.378		1.626	
B_{11}	3.346		4.016		4.724	
D_1	3/8" NPT	1/2" NPT	3/4" NPT	1" NPT	1 1/4" NPT	1 1/2" NPT
D_3	0.472		0.949		1.181	
D_4	1/2" — 13 NC		5/8" — 16 NC		3/4" — 10 NC	
D_5	0.374		0.551		0.551	
D_6	0.571		0.787		0.787	
H_1	1.181		1.575		1.890	
H_2	0.748		0.709		0.945	

Size	10 (1/2")		20 (1")		30 (1 1/2")	
Part No.	G406/5	G407/5	G408/5	G409/5	G410/5	G411/5
L_1	—		4.724		5.748	
L_2	1.693		3.366		4.488	
L_3	1.693		2.598		3.681	
L_4	1.260		3.563		4.626	
L_5	0.276		0.433		0.807	
L_6	3.937		5.039		6.220	
L_7	2.264		3.563		4.748	
L_8	0.787		0.787		0.866	
L_9	2.264		2.638		3.504	
L_{10}	1.398		2.185		2.992	
L_{11}	1.398		—		—	
L_{12}	—		1.319		1.752	
L_{13}	0.390		0.433		0.492	
L_{14}	0.138		—		—	
T_1	0.354		0.315		0.551	

Size	Screws	Tightening torque
10 (1/2")	(4) S.H.C.S. 1/2"—13 NC x 2 3/4"	118 ft-lb
20 (1")	(4) S.H.C.S. 5/8"—16 NC x 2 3/4"	235 ft-lb
30 (1 1/2")	(4) S.H.C.S. 3/4"—10 NC x 2 3/4"	417 ft-lb





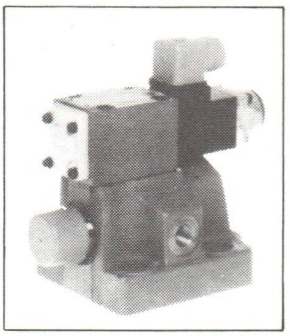
PressureControls

up to 5000 PSI
up to 80 GPM

The DB and DBW Design Series 40 valve is a pilot operated pressure control valve. It is manufactured in two models; the in-line or threaded and the subplate model. The in-line or threaded model, ORDERING CODE "G" has the pressure port on both sides of the valve, suitable for a T-mount connection. The DBW has a solenoid controlled operator to provide system unloading.

Low resistance to flow and extreme accuracy of repeatability of pressure setting is assured by the pilot orifices being directly in line. This reduces turbulent flow which occurs in most valves.

Design features -
- Subplate, threaded or manifold mounting capability
- Solenoid operated unloading by means of built-on Size 6 directional control valve.



DBW, Subplate mtg.

DB In-line model

TypeDB, Series40
Size10-1/2"to20-1" Refer to RA 25815

Ordering Code, Subplates and mounting bolts to be ordered separately

DB W 20 B G – 1 – XX / 350 Y 6A W220–60ND V / 5

(MOBILE NOT FOR USE WITH CODE "K")

SOLENOID CONTROLLED
- OMIT = If not required
- W = Solenoid vented

SIZE
- 10 = 1/2"
- 15 = 3/4"
- 20 = 1"

FOR USE WITH DBW ONLY
- A = Normally closed
- B = Normally open

MOUNTING
- OMIT = Subplate (Size 20 only)
- G = Threaded body (NPT)
- K = Cartridge (Size 20 only)

ADJUSTMENT
- 1 = Handwheel
- 2 = Screw

DESIGN SERIES
- 1X = Code 'K' only
- 4X = All others

MAX. OPERATING PRESSURE
- 50 = 750 PSI (50 bars)
- 100 = 1500 PSI (100 bars)
- 200 = 3000 PSI (200 bars)
- 350 = 5000 PSI (350 bars)

OPTIONS
- OMIT = Int. pilot - int. drain
- X = Ext. pilot - int. drain
- Y = Int. pilot - ext. drain
- XY = Ext. pilot - ext. drain

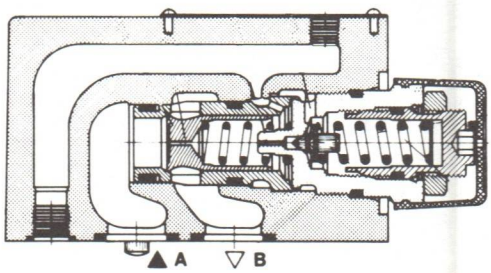
FOR USE WITH DBW ONLY

FOR USE WITH DBW ONLY
- W + VOLTS + HZ = AC
- G + VOLTS = DC
- N = Manual override
- D = Top electrical box
- DL = Top electrical box w/indicator light

V = Viton seals (standard)

Technical Data

Pressure Rating	5000 PSI (350 bar), ports A, B & X
	Port Y, DB Model, 3600 PSI (250 bar)
	Port Y, DBW Model, 900 PSI (60 bar)
Flow Rating	Subplate Model, Size 20, 80 GPM (300 l/min)
	Threaded Model, Size 10, 28 GPM (100 l/min)
	Size 15, 53 GPM (200 l/min)
	Size 20, 80 GPM (300 l/min)
Operating Temperature	-40°F (-20°C) to +170°F (+70°C)
Viscosity Range	35 SSU (2.8cSt) to 1750 SSU (380cSt)
Weight	Subplate G408/5 or G409/5, 6.6 lbs (3 kg)



Pilot Oil Connections, Refer to Ordering Code above

ORDERING CODE "omit" ORDERING CODE "Y" ORDERING CODE "X" ORDERING CODE "XY"

Pressure

Tank

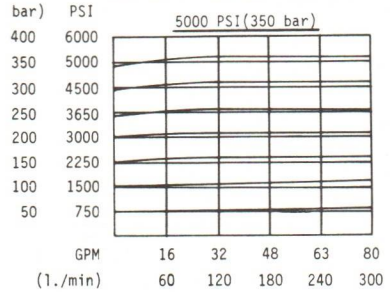
with Solenoid Valve Operator A or B (same ordering codes as above) DBW Valve

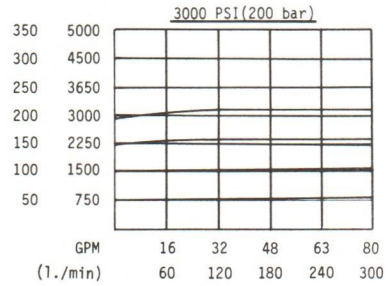
Performance Data

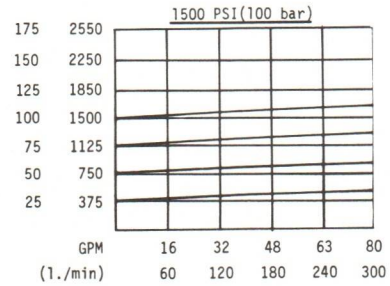
tests at 170 SSU(36cSt.) at 122°F(50°C)

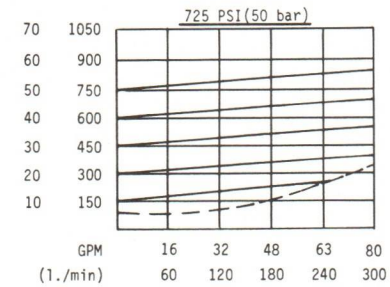
PRESSURE OVERRIDE CHARACTERISTIC

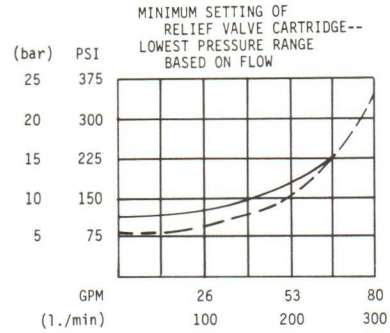
Operating Pressures based on flow--









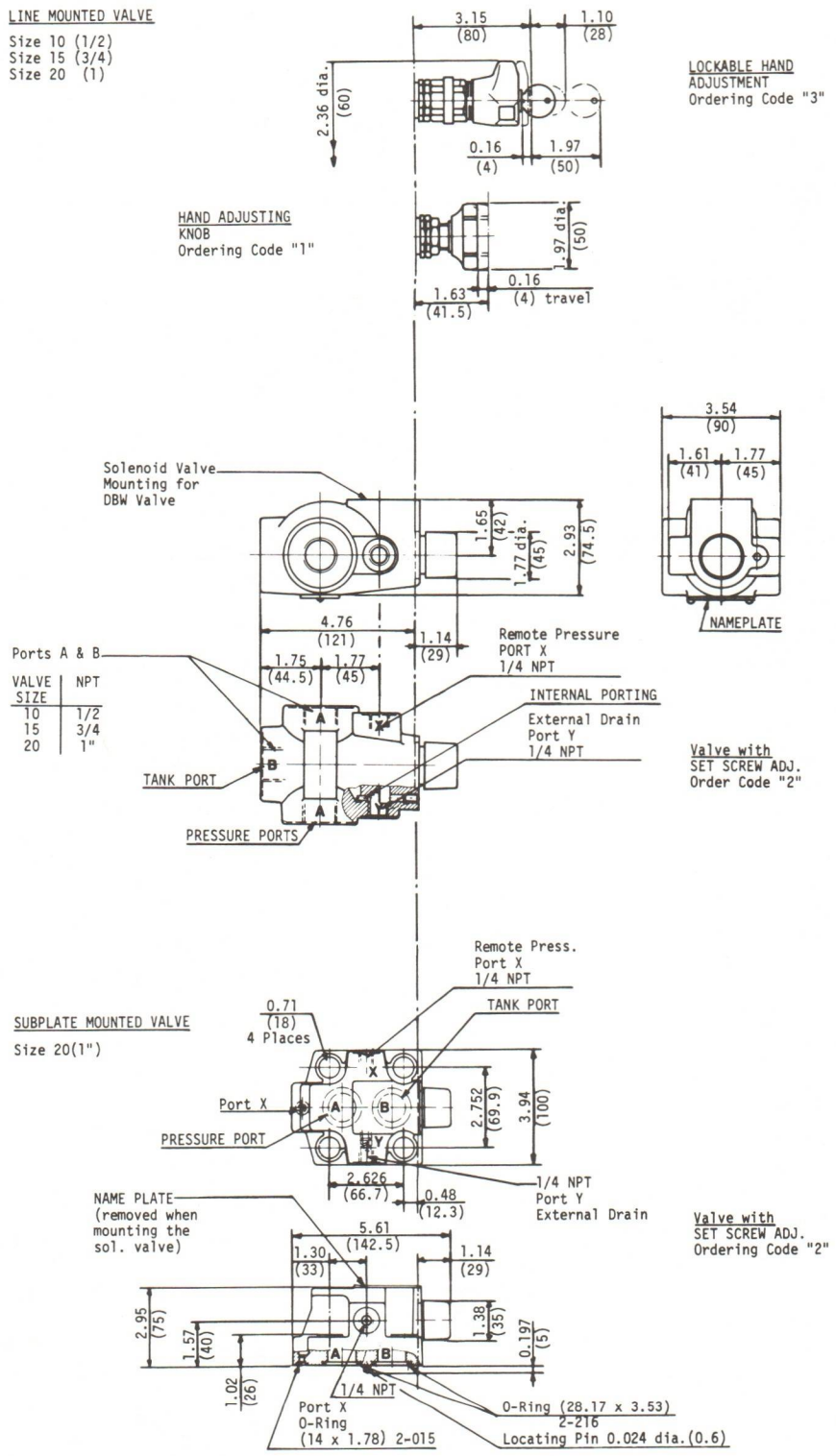


——— Lowest pressure setting for DB or DBW valve.

– – – – Lowest pressure range when venting the DBW valve.

Dimensional Data

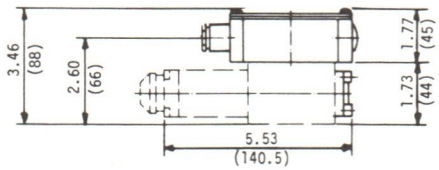
Inches (mm)



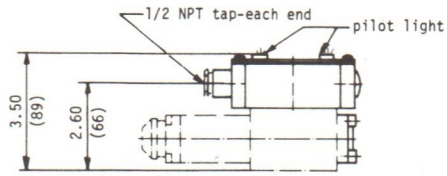
TypeDB, Series 40

ELECTRICAL BOX CONNECTOR

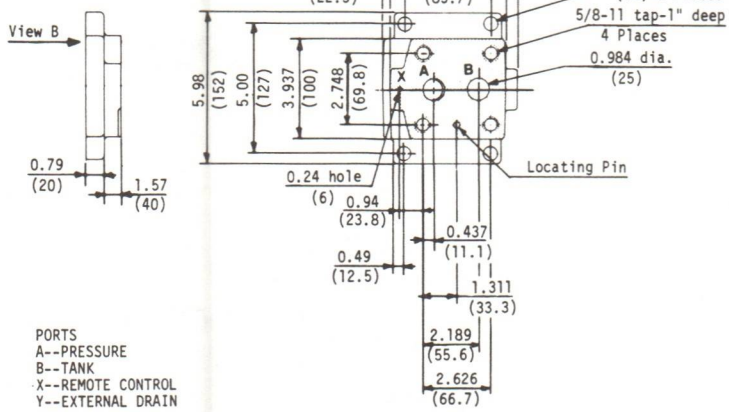
ORDERING CODE "D"
"STANDARD"



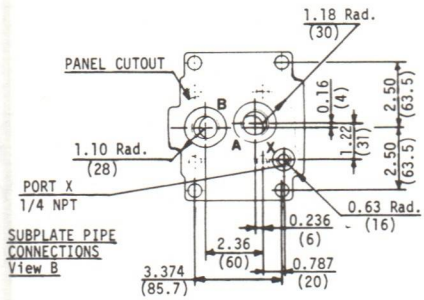
ELECTRICAL BOX CONNECTOR
with Pilot Light
ORDERING CODE "DL"
"OPTIONAL"



G408/5
G409/5



PORTS
A--PRESSURE
B--TANK
X--REMOTE CONTROL
Y--EXTERNAL DRAIN



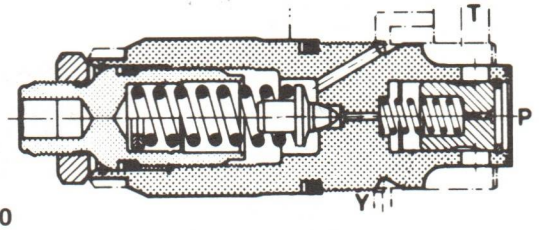
SUBPLATE-Ordering Information				
VALVE SIZE	MODEL NUMBER	A and B Port	VALVE MOUNTING SCREWS	Weight of Subplate
20(1")	G408/5 G409/5	3/4 NPT 1" NPT	4-5/8-11 x 2"	6.6 lbs. (3.0 kg)

Pressure Controls

NOTE - Type DBK available as a metric unit only.

Pressure control valves type DB..K are pilot operated pressure relief valves for mounting in manifold blocks.

- Pilot Operated
- Compact Size
- Reduces Cost of Piping
- Reduces Possible Leaks
- Greater Circuit Flexibility



Type DBK, Series 30
Size 6 -1/4 & 10 -1/2"

Refer to RA 25730

up to 5000 PSI
up to 26 GPM

Ordering Code

DB 10 K2 – 30 100 V *Additional Details

- **SIZE**
  - 6 = 1/4"
  - 10 = 1/2"
- **DESIGN SERIES**
- **SET PRESSURE**
  - 100 = 1500 PSI (100 bar)
  - 315 = 5000 PSI (315 bar)
- **SEALS**
  - Omit = Buna-N
  - V = Viton

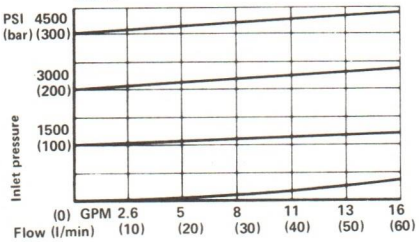
Technical Data

Size	Size 6 (1/4")	Size 10 (1/2")
Flow	16 GPM...(60 l/min)	26 GPM...(100 l/min)
Operating Pressure	5000...(315 bar)	
Set Pressure	1500 or...5000 PSI (100 to 315 bar)	
Seals	Buna-N supplied as standard,	
	Viton seals optional	
Fluid Temperature Range	-40°F (-20°C) ...+170°F (+70°C)	
Viscosity	35 SSU (2.8cSt) to 1750 SSU (380cSt)	

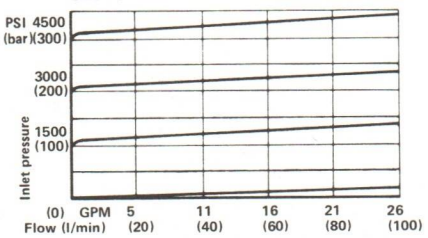
For applications to other specifications, please consult us.

Performance Curves (measured at ν = 36cSt and t = 50°C)

Size 6

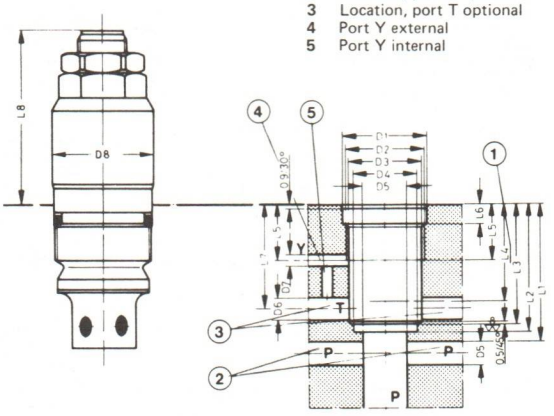


Size 10



Dimensional Data

1 Depth
2 Location, port P optional
3 Location, port T optional
4 Port Y external
5 Port Y internal



Type	D1 H7	D2	D3 H8	D4 +0.1	D5 max.	D6 max.	D7	D8
DB 6 K2-30/..	20,5	M 20 x 1	19	16	11	6	3	22
DB 10 K2-30/..	24,5	M 24 x 1	23	16	11	10,5	3	25

Type	L1 +0.3	L2 +0.1	L3 +0.2	L4	L5	L6 +0.2	L7 +0.1	L8
DB 6 K2-30/..	36	32	30	24	14	4,8	26	47
DB 10 K2-30/..	40	36	34	24	15	5,2	29,7	43

PressureControls

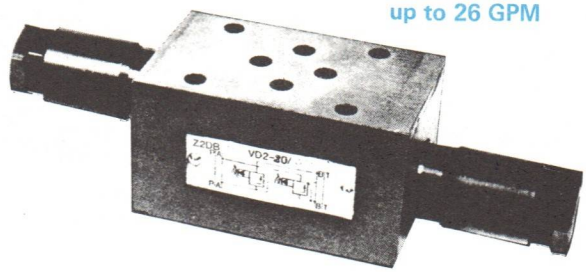
Pressure Relief Valve Sandwich Plate Design

up to 5000 psi
up to 26 GPM

ZDB/Z2DB sandwich relief valves are through-ported pilot operated reliefs, designed to mount between the directional control valve and its subplate or manifold.

System flow is ported through the sandwich block and the relief action is accomplished via internal passages in the sandwich block. These valves control relief P to T, A or B to T, A and B to T or cross ported B to A and A to B.

Design features:
- Low resistance to flow
- High repeatability
- High stability
- Extreme ease of service
- Simplifies system piping



Type ZDB/Z2DB Refer to RA25750
Size 6-1/4" & 10-1/2"

Ordering Code

Z 2 DB 6 V A 2– XX / 315 V

NUMBER OF RELIEF CARTRIDGES
- Omit = Single relief
- 2 = Double relief

SIZE
- 6 = 1/4" (ANSI D01)
- 10 = 1/2" (ANSI D02)

RELIEF CONDITION
- A = A to T
- B = B to T
- P = P to T
- C = A & B to T (Double Relief Only)
- D = A to B & B to A (Double Relief Only)

DESIGN SERIES

PRESSURE RATING
- 100 = 1500 psi (100 bars)
- 315 = 5000 psi (315 bars)

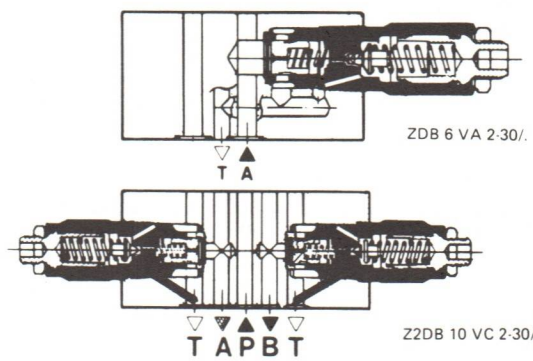
SEALS
- Omit = Buna-N
- V = VITON

Technical Data

Flow Size 6	15 GPM
Flow Size 10	26 GPM
Operating pressure	5000 PSI
Set pressure	1450 or 5000 PSI
Hydraulic medium	mineral oils, phosphate ester
Fluid temperature range	-4 to 160 F°
Viscosity	35 to 1750 SSU

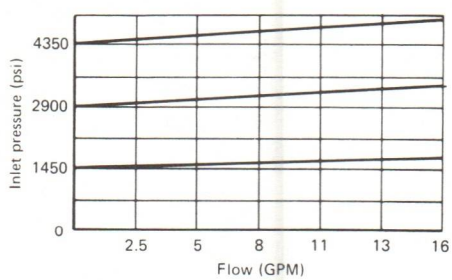
For applications to other specifications, please consult factory.

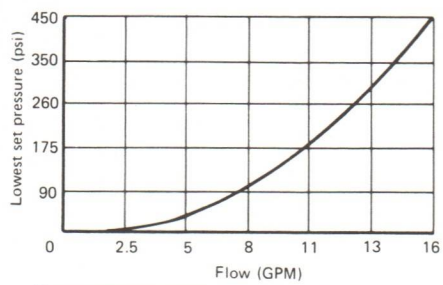
Section



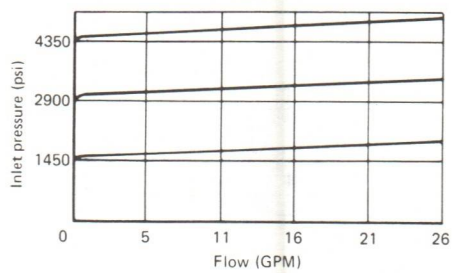
Performance Curves (measured at V=167.7 SSU t=50°)

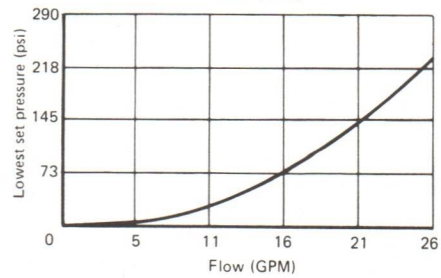
Size ZDB 6
Size Z2DB 6



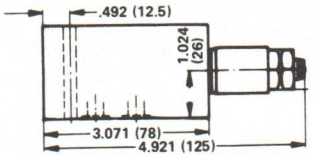


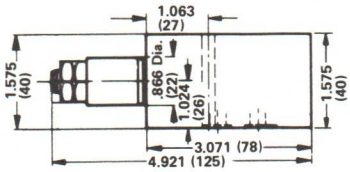
Size ZDB 10
Size Z2DB 10

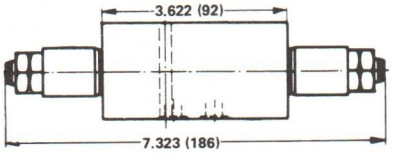


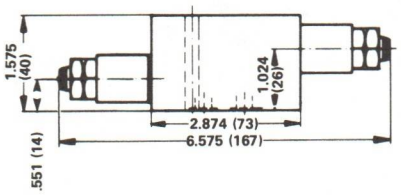


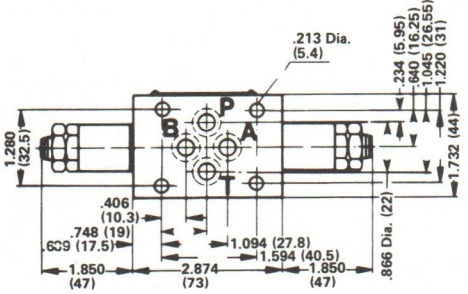
Size 6



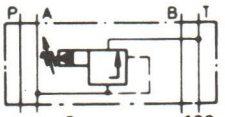




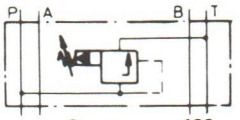




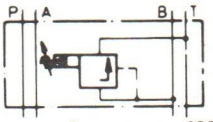
ZDB/Z2DB



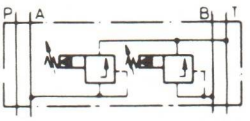
ZDB $\frac{6}{10}$ VA 2-30/$\frac{100}{315}$



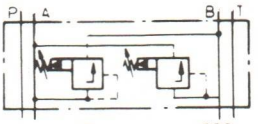
ZDB $\frac{6}{10}$ VP 2-30/$\frac{100}{315}$



ZDB $\frac{6}{10}$ VB 2-30/$\frac{100}{315}$

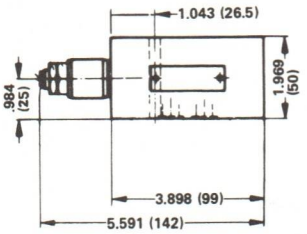


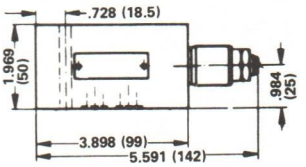
Z2DB $\frac{6}{10}$ VC 2-30/$\frac{100}{315}$

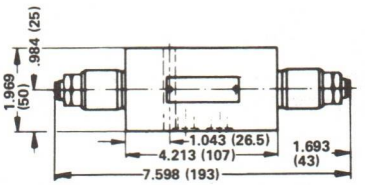


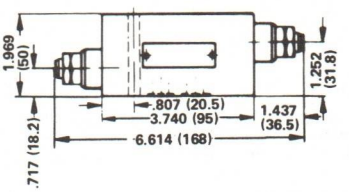
Z2DB $\frac{6}{10}$ VD 2-30/$\frac{100}{315}$

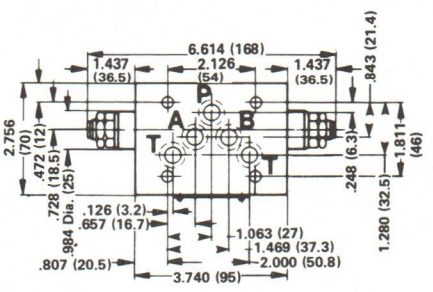
Size 10











Pressure Controls

Pressure relief valve, Type DBE/DBEM are pilot operated pressure relief valves of poppet valve design.

The DBE is a normal pilot operated relief valve with electrical input. The DBEM contains an additional spring set relief poppet for setting a maximum relief pressure independent of the electrical input.

Pressure relief valve, Type DBE

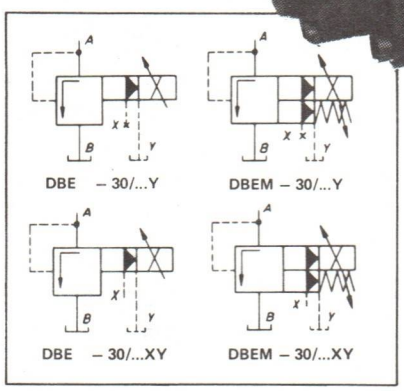
System pressure is adjusted by means of a proportional solenoid. Pressure from the system acts on the main poppet, and at the same time, via pilot line on the spring loaded side of the main poppet. Pressure is also acting against the pilot poppet. If system pressure exceeds the force from the solenoid, the pilot poppet opens. Pilot oil can then flow to tank. Orifices in the pilot line cause a pressure drop at the main poppet which lifts from its seat and opens the connection from pressure to tank.

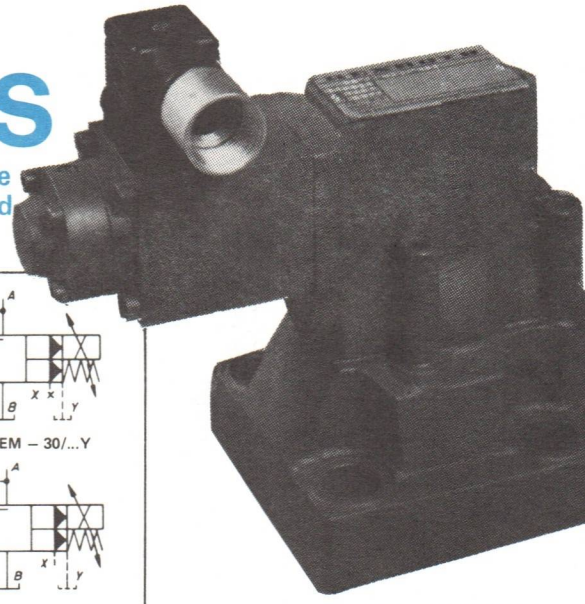
Pressure relief valve, Type DBEM

Operation is essentially the same as a DBE except a manually set poppet valve is hydraulically in parallel with the solenoid poppet. If pressure exceeds the safety poppet, the valve opens to relieve the pressure.

Pressure Relief Valve Electrically Operated

Refer to **RA 29142**





Type DBE/DBEM
Size 10 - 1/2" to 30 - 1 1/2"

up to 5000 PSI
up to 159 GPM

Ordering Code

DBE M OMIT 20 – XX/ 315 Y V

OMIT = Without maximum pressure protection
M = With maximum pressure protection
OMIT = For complete valve
C = Pilot valve & cartridge
T = Remote valve only
SIZE
10 = 1/2"
20 = 1" (ANSI R06)
30 = 1-1/2" (ANSI R10)
DESIGN SERIES

MAXIMUM OPERATING PRESSURE
50 = 750 PSI
100 = 1500 PSI
200 = 2900 PSI
315 = 4600 PSI
OPTIONS
Y = Int. pilot - ext. drain
XY = Ext. pilot - ext. drain
SEALS
OMIT = Buna-N
V = Viton

Technical Data

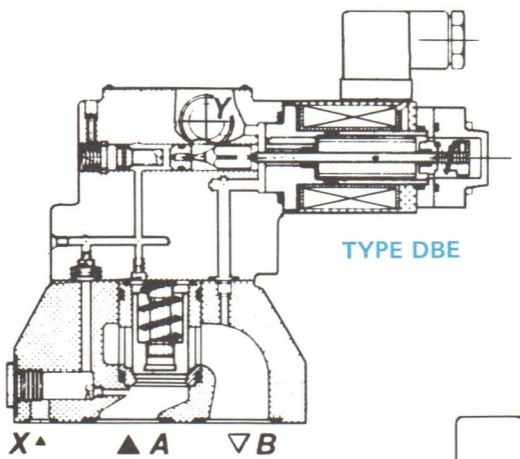
Technical Data Hydraulic

Maximum Operating Pressure	(Ports A, B, X) 5000 PSI (315 bar)
Operating Pressure Range	50 = 145 - 750 PSI (10 - 60 bar) 100 = 145 - 1500 PSI (10 - 120 bar) 200 = 145 - 3000 PSI (10 - 220 bar) 315 = 145 - 5000 PSI (10 - 340 bar)
Operating Pressure (Related to Flow)	See operating curves
Minimum Set Pressure at Zero Current	See minimum set pressure curves
Maximum Flow	Size 10, 53 GPM (200 l/min). Size 20, 106 GPM (400 l/min). Size 30, 160 GPM (600 l/min).
Pilot Flow	.185 GPM to .56 GPM (.7 l/min to 2 l/min)
Linearity	±3.5%
Repetition Accuracy	±2%
Hysteresis (See Performance Curve) At 200 Hz/200 MApp	With Dither ±2.5% Without Dither ±4.5%
Fluid Recommendation	Petroleum Based Hydraulic Oils
Operating Temperature	-40°F to +170°F (-20°C to +70°C)
Viscosity Range	35 SSU to 1750 SSU (2.8cSt to 380cSt)
Filtration	10 micron (pressure supply line)
Shifting Time	30 MS to 150 MS (dependent on unit)

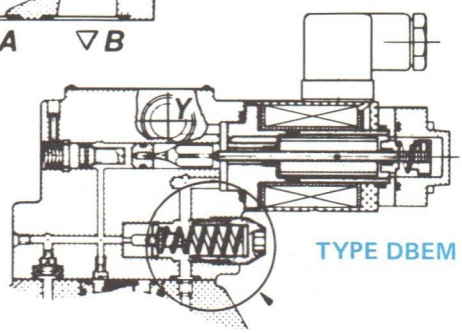
Technical Data Electrical

Control Current Range	200 to 800 MA DC
Maximum Coil Voltage	24 VDC
Coil Resistance	19.5 Ω /70°F to 28.8 Ω Hot
Ambient Temperature	112°F
Electrical Connection	Plug-in
Insulation	NEMA Class "B" or better
Amplifier	VT 2000 (See data sheet RA 29911)

Section



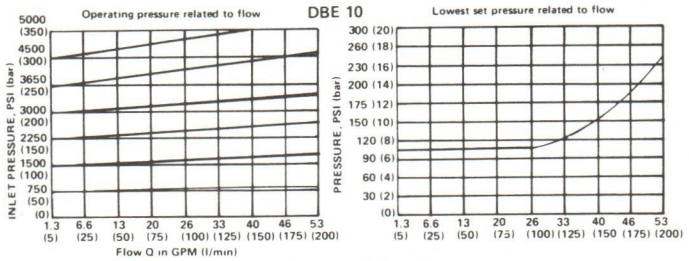
TYPE DBE



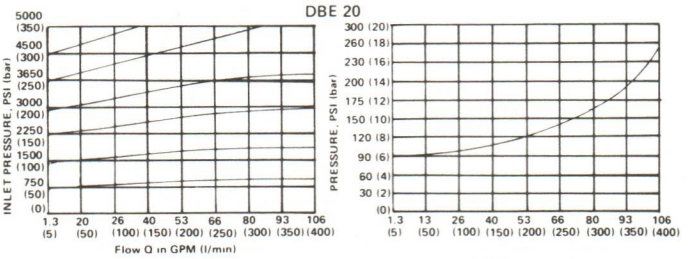
TYPE DBEM

Performance Curves (measured at 36cSt and 50°C)

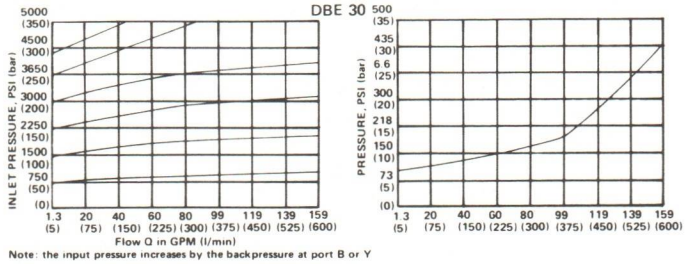
DBE10


Operating pressure related to flow
DBE 10
Lowest set pressure related to flow
INLET PRESSURE, PSI (bar)
PRESSURE, PSI (bar)
Flow Q in GPM (l/min)

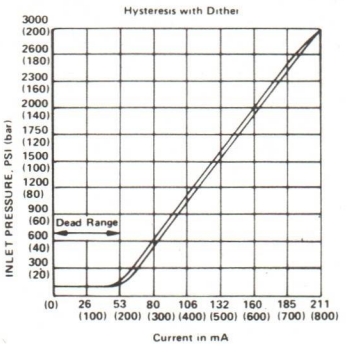
DBE20



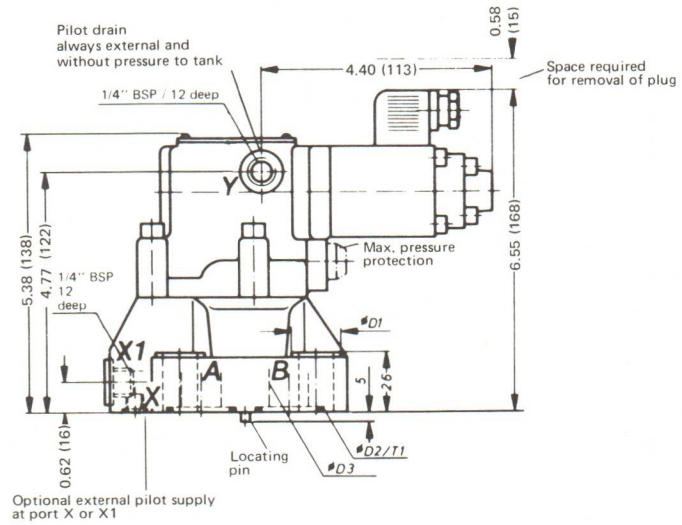
DBE30

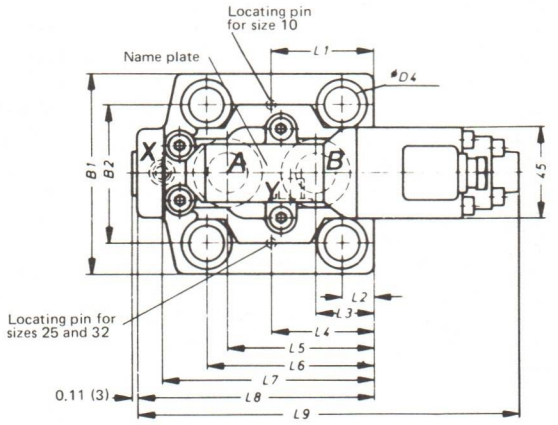


Note: the input pressure increases by the backpressure at port B or Y



Dimensional Data

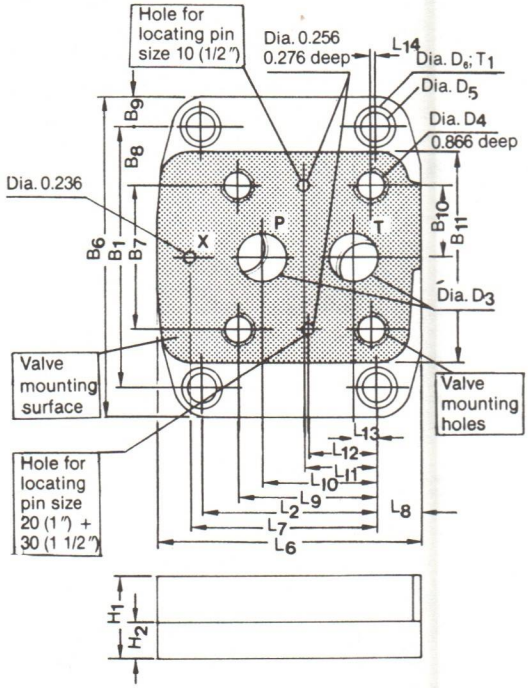


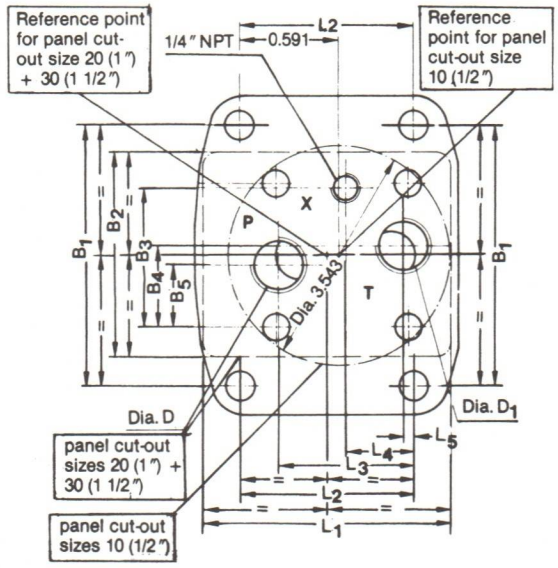


Valve Size	B1	B2	D1	Dimensions, inches (mm) D2	D3	D4	L1
DBE 10 DBEM 10	3 07 (78)	2.13 (54)	.71 (18)	.86 (21.8)	.47 (12)	.55 (14)	1.74 (44.3)
DBE 20 DBEM 20	3.94 (100)	2.76 (70)	.95 (24)	1.37 (34.8)	.95 (24)	.71 (18)	
DBE 30 DBEM 30	4.53 (115)	3.25 (82.5)	1.10 (28)	1.61 (41)	1.18 (30)	.79 (20)	

Valve Size	L2	L3	L4	L5	L6	L7	L8	L9	T1	Wt. lbs(kg)
DBE 10 DBEM 10	.49 (12.5)	.74 (18.9)		1.74 (44.3)	2.62 (66.5)	2.62 (66.5)	3.54 (90)	6.95 (176.5)	.079 (2)	9 (4.1)
DBE 20 DBEM 20	.63 (16)	1.07 (27.1)	1.95 (49.4)	2.82 (71.6)	3.26 (82.7)	4.19 (106.5)	4.61 (117)	7.48 (190)	.114 (2.9)	10 (4.5)
DBE 30 DBEM 30	.69 (17.5)	1.19 (30.2)	2.44 (61.9)	3.69 (93.7)	4.15 (106.4)	5.44 (138.2)	5.83 (148)	7.87 (200)	.114 (2.9)	13 (6)

TypeDBE





Size	10 (1/2")		20 (1")		30 (1 1/2")	
Part No.	G406/5	G407/5	G408/5	G409/5	G410/5	G411/5
Weight (lbs)	4.0	4.0	8.0	8.0	12.8	12.8
B_1	4.193		5.000		5.748	
B_2	—		3.937		4.724	
B_3	2.067		2.756		3.386	
B_4	1.260		1.378		1.626	
B_5	0.866		1.378		1.626	
B_6	5.118		6.063		6.850	
B_7	2.126		2.756		3.248	
B_8	1.031		1.122		1.252	
B_9	0.465		0.531		0.547	
B_{10}	1.063		1.378		1.626	
B_{11}	3.346		4.016		4.724	
D_1	3/8" NPT	1/2" NPT	3/4" NPT	1" NPT	1 1/4" NPT	1 1/2" NPT
D_3	0.472		0.949		1.181	
D_4	1/2" — 13 NC		5/8" — 16 NC		3/4" — 10 NC	
D_5	0.374		0.551		0.551	
D_6	0.571		0.787		0.787	
H_1	1.181		1.575		1.890	
H_2	0.748		0.709		0.945	

Size	10 (1/2")		20 (1")		30 (1 1/2")	
Part No.	G406/5	G407/5	G408/5	G409/5	G410/5	G411/5
L_1	—		4.724		5.748	
L_2	1.693		3.366		4.488	
L_3	1.693		2.598		3.681	
L_4	1.260		3.563		4.626	
L_5	0.276		0.433		0.807	
L_6	3.937		5.039		6.220	
L_7	2.264		3.563		4.748	
L_8	0.787		0.787		0.866	
L_9	2.264		2.638		3.504	
L_{10}	1.398		2.185		2.992	
L_{11}	1.398		—		—	
L_{12}	—		1.319		1.752	
L_{13}	0.390		0.433		0.492	
L_{14}	0.138		—		—	
T_1	0.354		0.315		0.551	

Size	Screws	Tightening torque
10 (1/2")	(4) S.H.C.S. 1/2"—13 NC x 2 3/4"	118 ft-lb
20 (1")	(4) S.H.C.S. 5/8"—16 NC x 2 3/4"	235 ft-lb
30 (1 1/2")	(4) S.H.C.S. 3/4"—10 NC x 2 3/4"	417 ft-lb

PressureControls

The two-stage valves are used in conjunction with (high pressure/low pressure systems).

Type DU 16 gives leakfree closure between high pressure and low pressure sides.

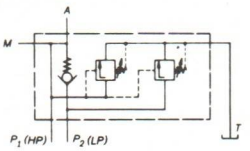
The maximum pressure setting on the high pressure side is 9000 PSI, while four pressure ratings are available for the low pressure side - up to 210 PSI, up to 450 PSI, up to 900 PSI and up to 1500 PSI.

The high pressure adjustment is effected by means of a set screw, handwheel or lockable handknob. For repetition of the required setting a scale is provided on the sleeve*. The low pressure adjustment is by means of a set screw arrangement only, which is protected by a cap. The selected pressure setting can be fixed by means of a locknut on all types of adjustment.

*Lockable handknob adjustment only.

Two Stage Relief

Up to 9.3 GPM @ 9000 PSI HP Side
Up to 33 GPM @ 1500 PSI LP Side



TypeDU Refer to RA 26233 Size16-3/4"

Ordering Code

DU 16 DG1 – XX / 630 – 100 V / 5

- **ADJUSTMENT**
  - 1 = Handwheel
  - 2 = Screw w/protective cap
  - 3 = Key lock
- **DESIGN SERIES**
- **HIGH PRESSURE PORT (MAX.)**
  - 630 = 9000 PSI
- **LOW PRESSURE PORT (MAX.)**
  - 15 = 220 PSI
  - 33 = 500 PSI
  - 63 = 1000 PSI
  - 100 = 1500 PSI
- **SEALS**
  - OMIT = Buna-N
  - V = Viton

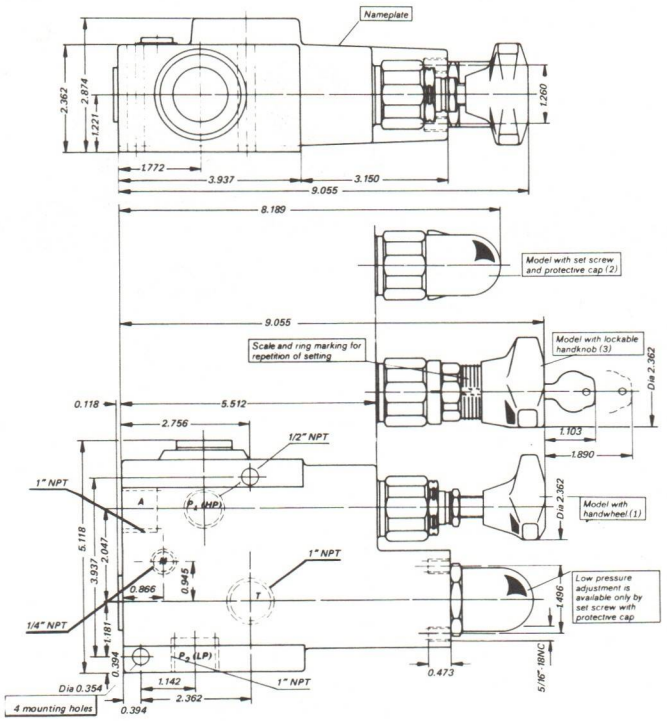
Technical Data

Pressure setting range: low pressure in PSI		up to 210, 450, 900 & 1500 PSI
high pressure in PSI		up to 9000 PSI
Max. Operating Pressure	Port P_1 (HP) & A	up to 9000 PSI
	Port P_2 (LP)	up to 1500 PSI
	Port T	up to 210 PSI

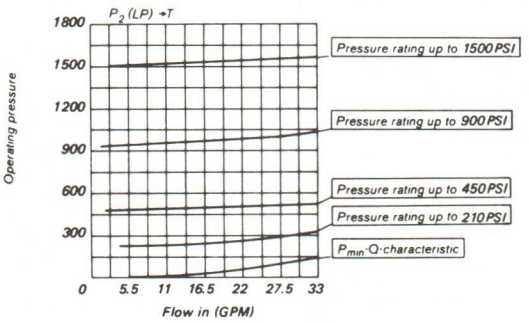
Hydraulic medium	Mineral oil	
Fluid temperature range	–4 to +160° F	
Viscosity range	35 to 1750 SSU	
Flow rating	Low pressure	High pressure
	up to 33 GPM	up to 9.3 GPM

For applications to other specifications please consult us.

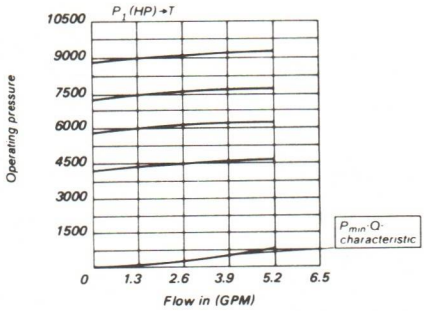
Dimensional Data



Performance Data



p-Q-characteristic for low pressure side



p-Q-characteristic for high pressure side

Rexroth Pressure Control Capabilities

Type DB Pilot Operated Pressure Relief Flanged or manifold mount
Size 52 to 82 - 2½" to 3½"

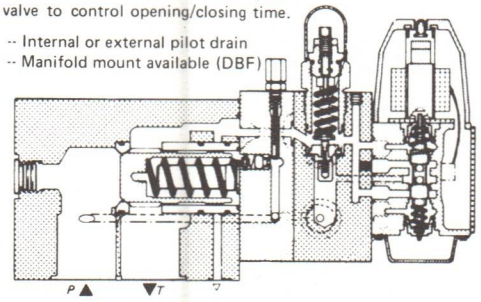
The DB/DBW type valves are pilot operated poppet-type pressure reliefs which serve to limit or unload system pressure.

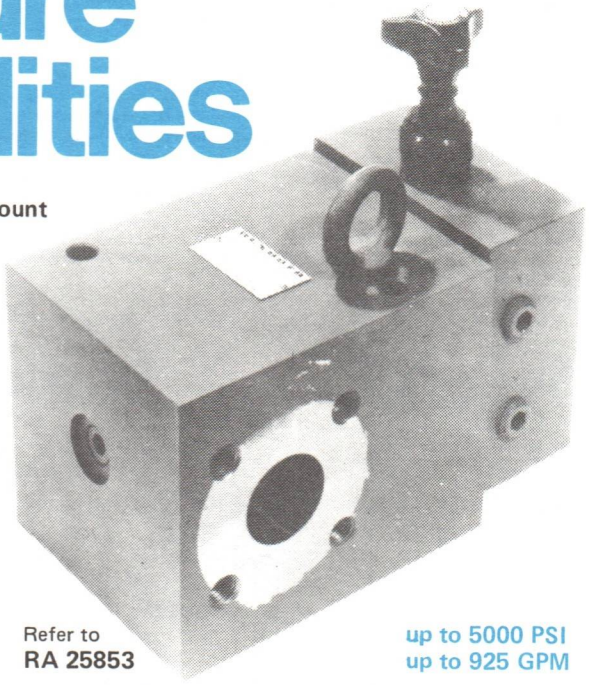
TYPE DB
Type DB is a pilot operated, poppet designed to limit system pressure set by means of a manually adjusted spring.

TYPE DBW
Type DBW is a solenoid controlled, pilot operated poppet designed to unload system pressure. This design utilizes a size 10 (⅜") directional control valve to unload the main spool.

PILOT CHOKE ADJUSTMENT
A pilot choke adjustment can be inserted between the main and pilot valve to control opening/closing time.

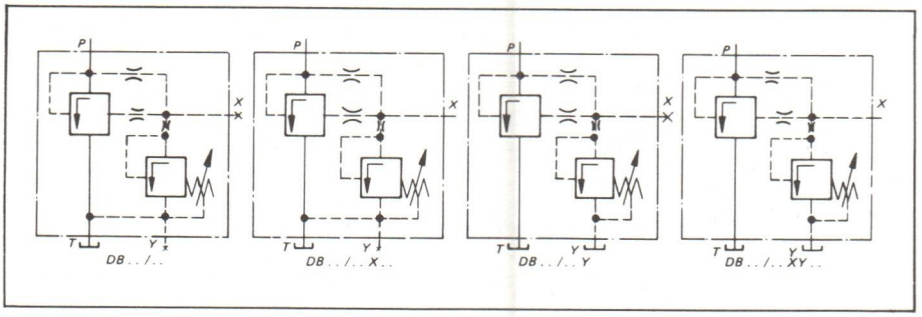
-- Internal or external pilot drain
-- Manifold mount available (DBF)

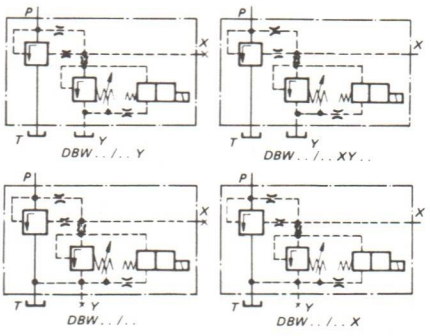




Refer to
RA 25853

up to 5000 PSI
up to 925 GPM





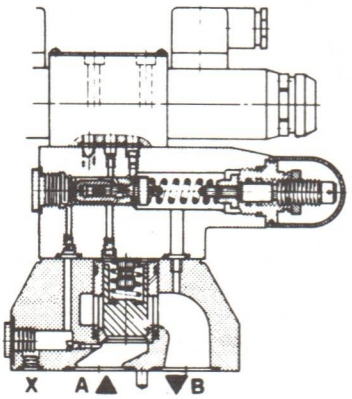
Type DB 3U Pilot Operated Pressure Relief
Size 10 to 30 ½" to 1½"

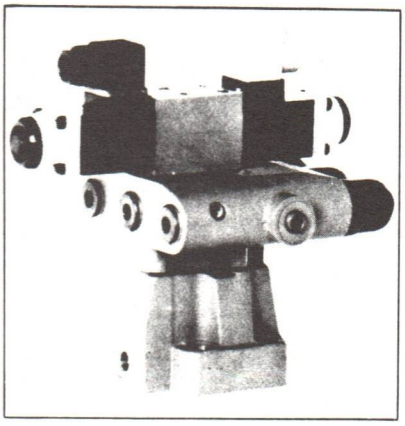
Should 3-stage pressure relief be required in a system, this can be achieved by the use of a pressure relief valve with triple pilot. It is important that the maximum pressure is set with the center pilot. The lower pressures can then be set with either the left- or right-hand pilots. The valves are actuated by means of a built-on directional control valve. By operating solenoid 'a' or 'b', the corresponding pressure stage is actuated. The basic model is supplied with an 'E' type spool.

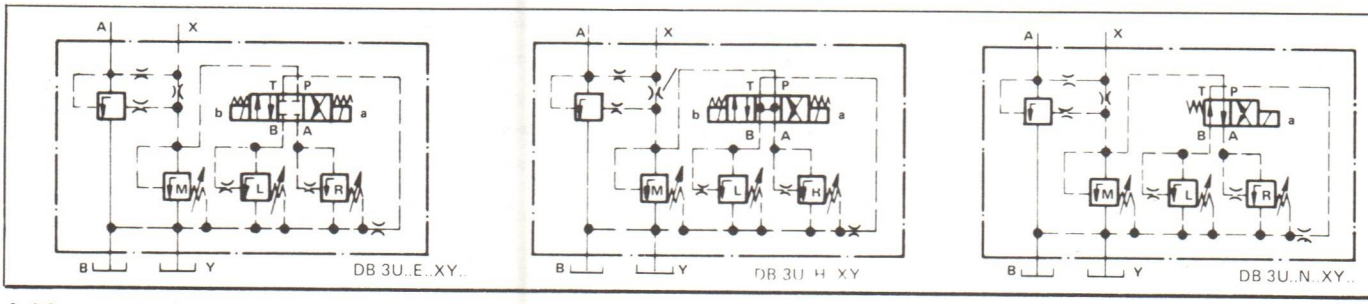
For other applications spool types 'H' and 'N' are available as alternatives.

up to 5000 PSI
up to 159 GPM

Refer to
RA 25825







PressureControls

The DZDP Series Multi-Function Pressure Control valves are direct-operated spool type design with built-in by pass check; subplate mounted only.

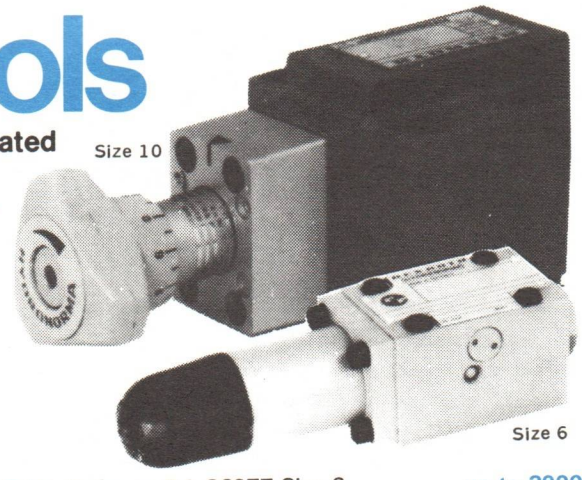
These valves can be typically used as in sequence (internal pilot/external drain), counterbalance (internal or external pilot/internal drain) or unloading (external pilot/external drain). Not recommended for use in accumulator circuits (see DA/DAW Series).

Four pressure ratings of 350, 1000, 2000 and 3000 PSI are available. The maximum pressure setting is 3000 PSI. Adjustment of the pressure setting can be achieved via a set screw, or a rotary handknob, of which a lockable version is also available. Handknob adjustment is available only for pressure ratings 350 and 1000 PSI.

A scale is provided on the valve to allow repetition of the required pressure setting.

The selected pressure can be locked with an axially arranged set screw on all models.

Direct Operated Pressure Relief Valve



TypeDZDP, Size6-1/4"&10-1/2"

Refer to **RA 26077**,Size 6
Refer to **RA 26097**,Size 10

up to 3000 PSI
up to 12 GPM

Ordering Code

DZ 10 DP 2 – X X / 210 X M V

SIZE
- 6 = 1/4" (ANSI DO1)
- 10 = 1/2" (ANSI P03)

ADJUSTMENT
- 1 = Handwheel
- 2 = Screw w/protective cap
- 3 = Key lock

DESIGN SERIES

MAX. OPERATING PRESSURE
- 25 = 350 PSI
- 75 = 1000 PSI
- 150 = 2000 PSI
- 210 = 3000 PSI

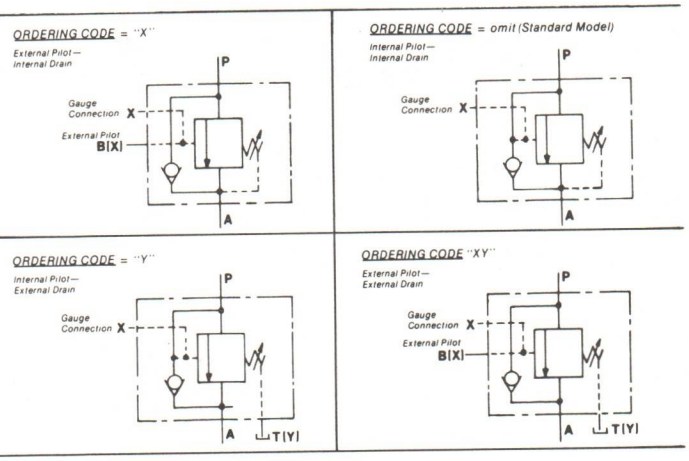
OPTIONS
- OMIT = Int. pilot int. drain
- X = Ext. pilot int. drain
- Y = Int. pilot ext. drain
- XY = Ext. pilot ext. drain

OMIT = With built-in check
M = Without built-in check

SEALS
- OMIT = Buna-N
- V = Viton

Technical Data

	Size 6	Size 10
Maximum Pressure	Ports 3000 PSI P & X 210 bar	Ports 4500 PSI A & X 315 bar
Maximum Operating Pressure	3000 PSI (210 bar)	
Maximum Back Pressure	Port T 900 PSI	220 PSI
	60 bar	15 bar
Maximum Flow	8 GPM (30 l/min)	12 GPM (45 l/min)
Fluid Recommendation	Petroleum based hydraulic fluids	
Temperature Range	-4°F (-20°C) to +160°F (+70°C)	
Viscosity Range	35 SSU (2.8cSt) to 1750 SSU (380cSt)	

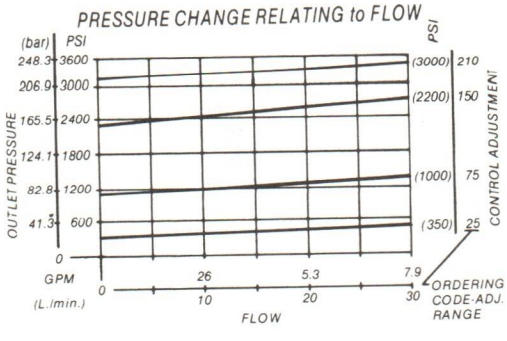


Performance Data

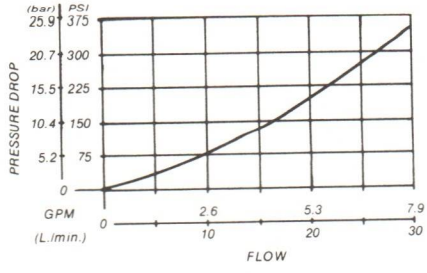
Measured with 168 SSU(36 cSt.) and 122°F (50C)

Size6

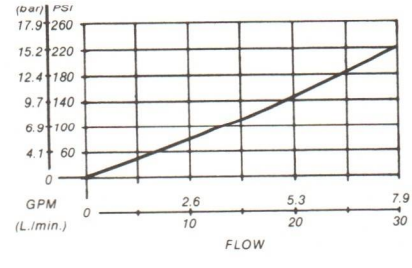
PRESSURE CHANGE RELATING to FLOW



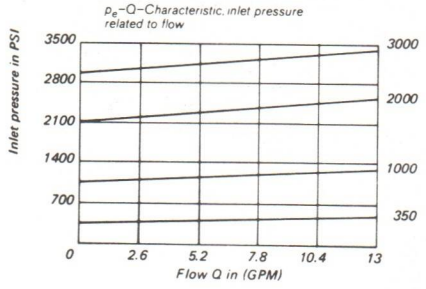
PRESSURE DROP THROUGH CHECK VALVE

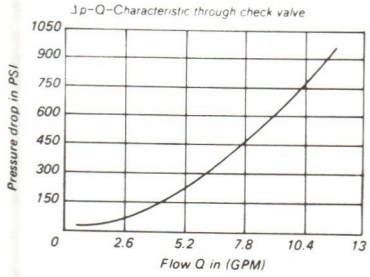


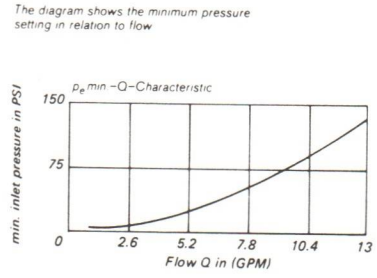
MINIMUM PRESSURE SETTING OF VALVE RELATING TO FLOW



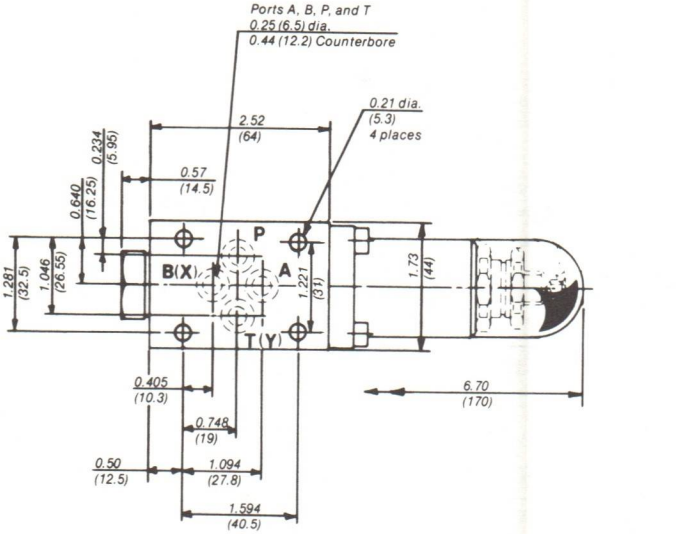
Size 10

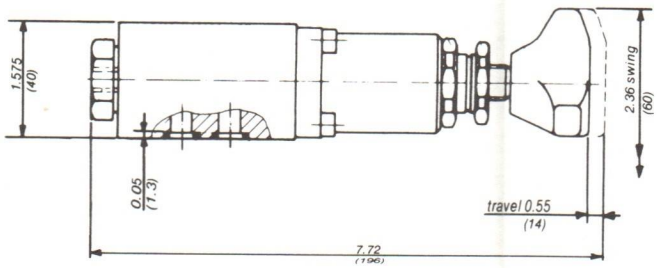


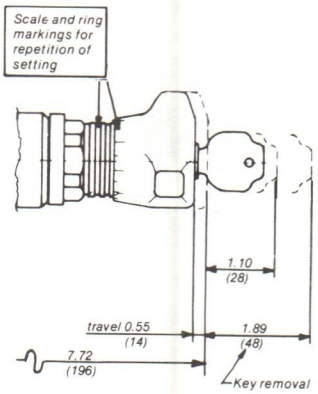




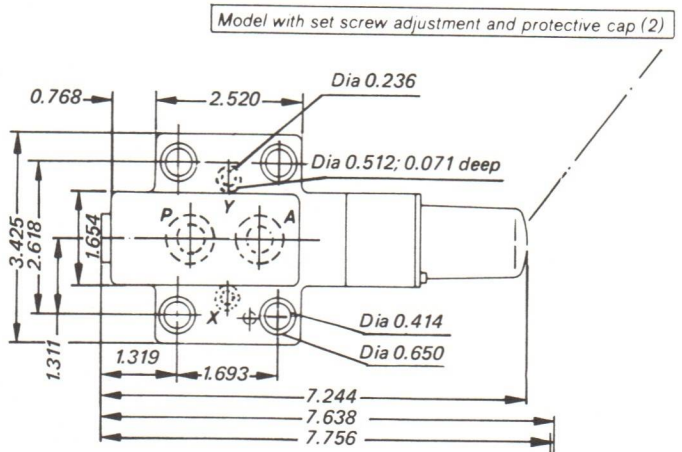
Size 6

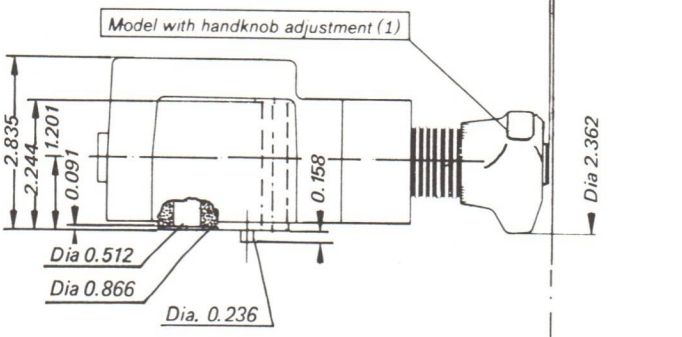


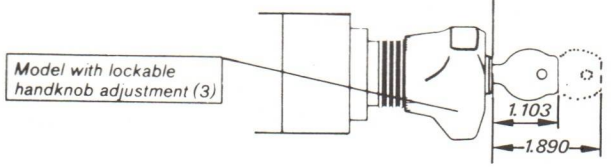




Size 10

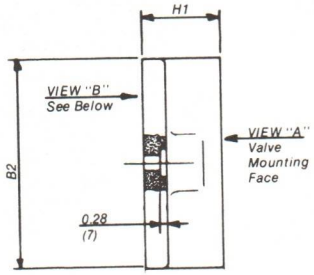


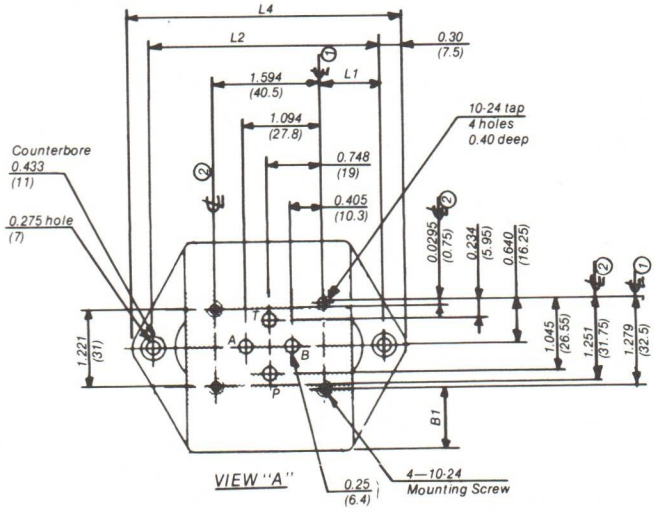




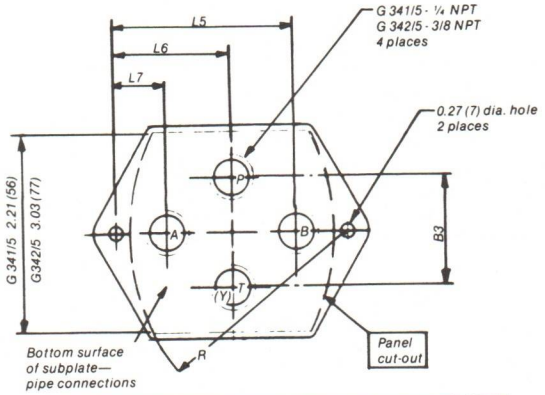
Size 6

ANSI DO1 Mounting Pattern





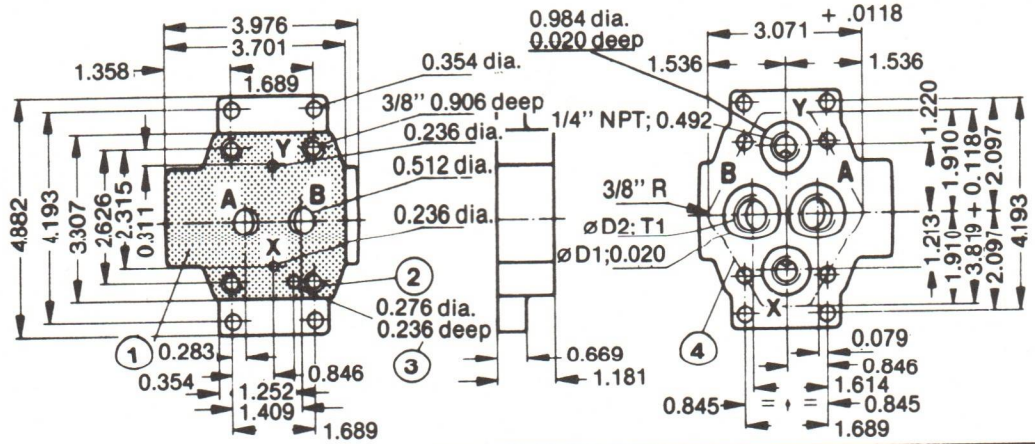
DIMENSION in inches (mm)



Subplate	Mounting Screws	Tightning Torque	Weight
G 341/5 G 342/5	Socket Head Cap Screws 10-24 x 2"	4.4 lb. ft. (6 Nm)	2.2 lbs. 1 Kg.

Subplate	B1	B2	B3	L1	L2	L4	L5	L6	L7	H1	R Rad.	
G 341/5	0.50 (12.7)	2.28 (58)	1.34 (34)	0.827 (21)	3.150 (80)	3.74 (95)	2.284 (58)	1.575 (40)	0.87 (22)	0.984 (25)	2.76 (70)	
G 342/5	0.93 (23.7)	3.15 (80)	1.73 (44)	1.023 (26)	3.543 (90)	4.13 (105)	2.717 (69)	1.772 (45)	0.827 (21)	1.18 (30)	3.35 (85)	

Size 10



Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
10	G 460/1	1.102	3/8"	0.492	4 3/8" x 2 1/4" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	4 lbs.
	G 461/1	1.339	1/2"	0.571			

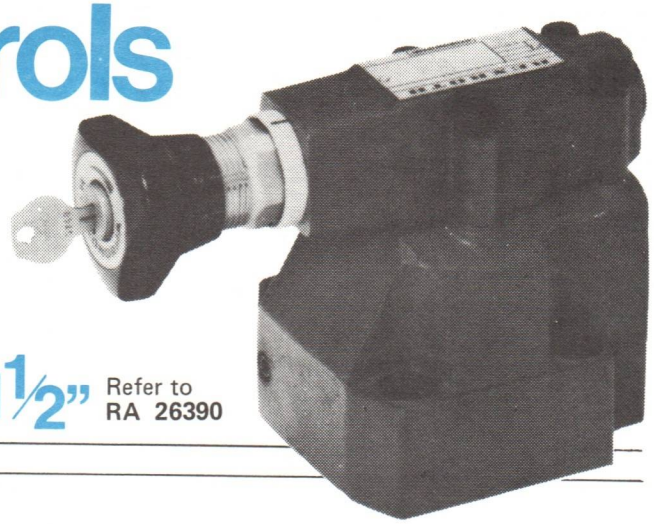
PressureControls

The DZ series multi-function pressure control valves are pilot operated poppet type design with built-in bypass check, subplate mounted only. These valves can be typically used as sequence (internal pilot/external drain), counterbalance (internal or external pilot/internal drain), or unloading (external pilot/external drain). Not recommended for use in accumulator circuits. (See DA/DAW series)

Pilot Operated Pressure Sequence Valve

- for use as pressure relief, sequence or bypass valve
- optional check valve
- manifold block mounting

up to 3000 PSI
up to 119 GPM



TypeDZ Size10-1/2"to30-1 1/2"

Refer to RA 26390

Ordering Code

DZ OMIT 20 1 – XX/ 210 XY V / 5

OMIT = For complete valve
C = Pilot valve only
C + SIZE = Pilot valve & cartridge

SIZE
10 = 1/2" (ANSI P03)
20 = 1" (ANSI P06)
30 = 1-1/2" (ANSI P10)

ADJUSTMENT
1 = Handwheel
2 = Screw w/protective cap
3 = Key lock

DESIGN SERIES

MAX OPERATING PRESSURE
210 = 3000 PSI

OPTIONS
OMIT = Int. pilot - int. drain
X = Ext. pilot - int. drain
Y = Int. pilot - ext. drain
XY = Ext. pilot - ext. drain

SEALS
OMIT = Buna-N
V = Viton

Technical Data

Size	10	25	32
Hydraulic medium	mineral oils, phosphate ester		
Fluid temperature range	-4 to 160°F		
Viscosity range	35 to 1750 SSU		
Operating pressure, ports A, B, X	4568 PSI		
Backpressure, port Y	4568 PSI		
Set sequence pressure	44 PSI (Q related) up to 3045 PSI		
Flow	up to 40 GPM	to 80 GPM	to 119 GPM

For applications to other specifications, please consult us.

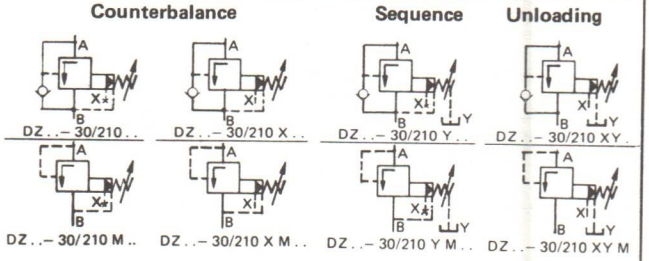
Pressure control valves type DZ are pilot operated pressure sequence valves.

They are used to switch a secondary system at a set pressure.

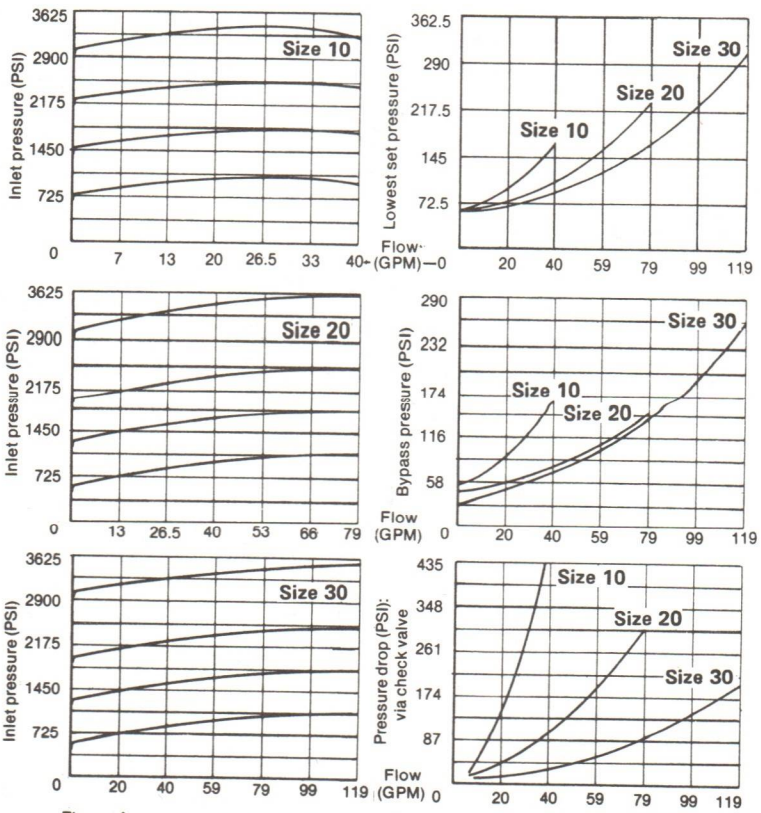
Pressure sequence valves comprise:
pilot valve with pressure setting elements, main valve with main spool, also optional check valve.

The valve function varies according to pilot drain configuration.

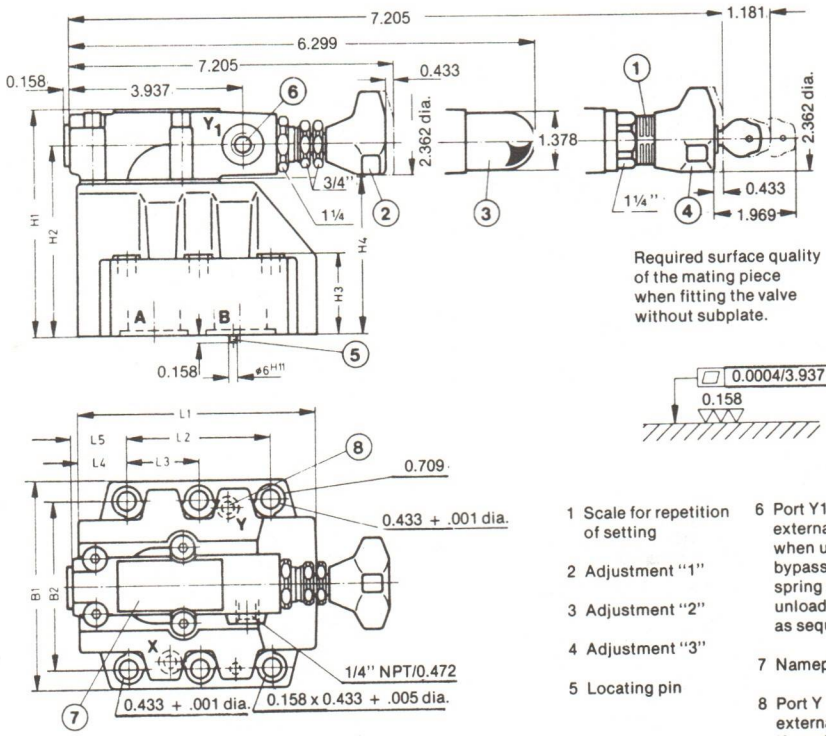
Counterbalance | **Sequence** | **Unloading**



Performance Curves, measured at v=168 SSU and 120° F



The performance curves were measured with external pilot drain without pressure.
With internal pilot drain, the inlet pressure increases by the outlet pressure at port B.



1 Scale for repetition of setting

2 Adjustment "1"

3 Adjustment "2"

4 Adjustment "3"

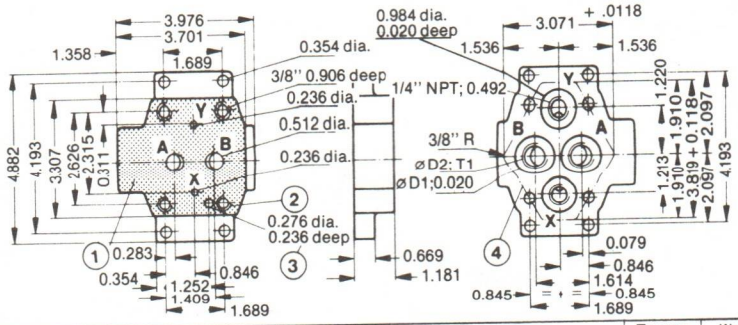
5 Locating pin

6 Port Y1 external pilot drain when used as bypass valve; spring chamber unloading if used as sequence valve

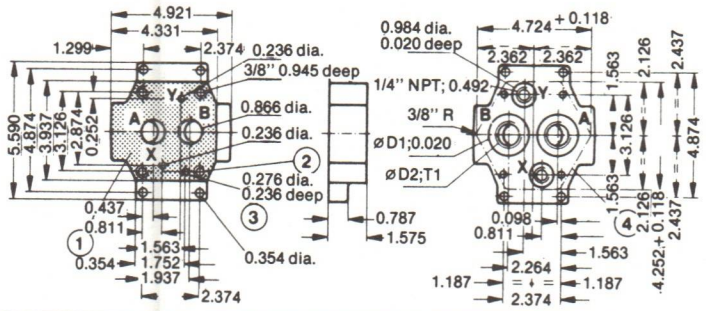
7 Nameplate

8 Port Y external pilot drain if used as bypass valve

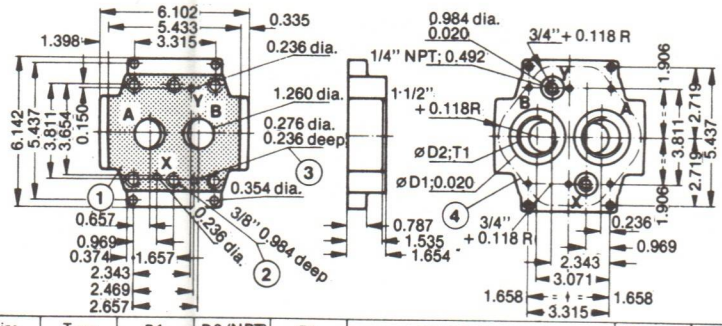
Size	B1	B2	H1	H2	H3	H4	L1	L2	L3	L4	L5	O-ring ports X, Y	O-ring ports A, B	Weight
10	3.346	2.626	4.409	3.622	1.102	2.835	3.543	1.689	—	1.398	1.358	2-012	2-115	8 lbs.
20	4.016	3.126	4.803	4.016	1.496	3.228	4.409	2.374	—	1.319	1.457	2-012	2-216	12 lbs.
30	4.724	3.811	5.118	4.331	1.811	3.543	5.512	3.315	1.657	1.102	1.232	2-012	2-220	18 lbs.



Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
10	G 460/1	1.102	3/8"	0.492	4 3/8" x 2 1/4" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	4 lbs.
	G 461/1	1.339	1/2"	0.571			

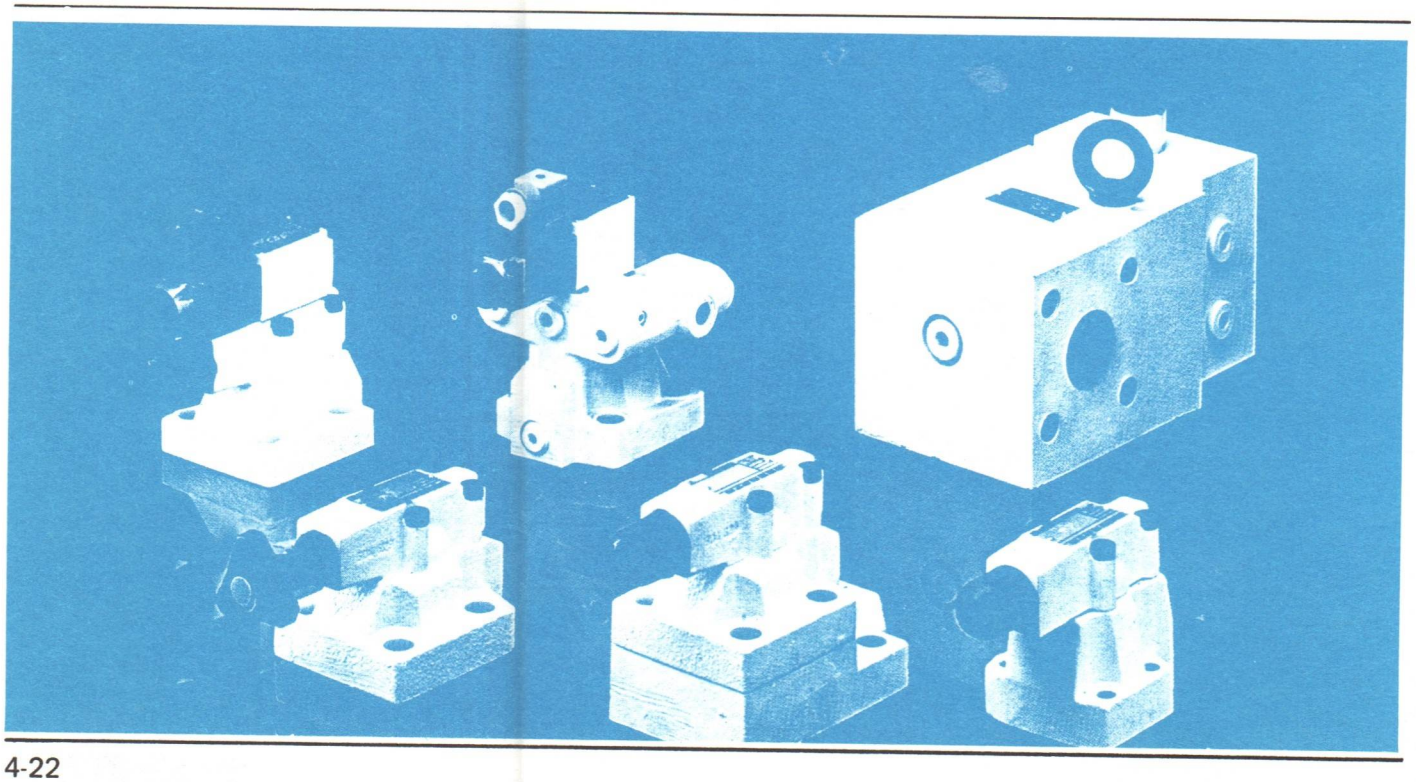


Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
20	G 412/1	1.654	3/4"	0.650	4 3/8" x 2 1/2" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	7 lbs.
	G 413/1	1.850	1"	0.768			



1 Valve mounting surface
2 Valve fixing holes
3 Hole for locating-pin
4 Front panel cut-out

Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
30	G 414/1	2.205	1 1/4"	0.807	6 3/8" x 2 3/4" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	11 lbs.
	G 415/1	2.402	1 1/2"	0.886			



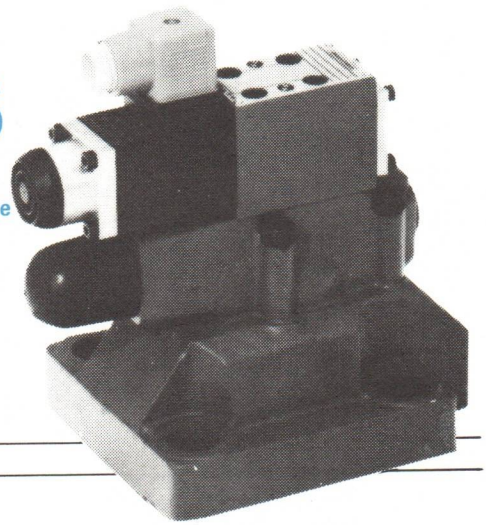
PressureControls

The DA/DAW Series Unloading Valves are pilot operated, poppet design unloading valves with built-in by pass check; subplate mounted only.

These valves have a fixed differential of the effective areas between the pilot relief and the unloading poppet which prevents rapid cycling of the pump between the loaded and unloaded conditions, and they are typically used in accumulator or high-low circuits. Refer to circuits schematics.

Accumulator Unloading and Hi-Low Pump Unloading Valve

up to 4500 PSI
up to 65 GPM



Type DA/DAW Size 10" - 1/2" to 30 - 1 1/2"

Refer to RA 26410

Ordering Code

DA W 30 A 3 – 3X 315 Y W220-50 N Z4 V / 5

DIRECTIONAL CONTROL
- OMIT = Without valve
- W = With valve

SIZE
- 10 = 1/2" (ANSI PO3)
- 20 = 1" (ANSI PO6)
- 30 = 1-1/2" (ANSI P10)

SOLENOID OPERATOR
- A = Normally closed
- B = Normally closed

CONTROL ADJUSTMENT
- 1 = Rotary knob
- 2 = Setscrew w/protective cap
- 3 = Keylock in rotary knob

DESIGN SERIES

ADJUSTABLE PRESSURE RANGE
- 80 = 290 PSI (20 bar) to 1150 PSI (80 bar)
- 160 = 1150 PSI (80 bar) to 2300 PSI (160 bar)
- 315 = 2300 PSI (160 bar) to 4500 PSI (315 bar)

PILOT DRAINS
- OMIT = Internal
- Y = External

SOLENOID OPERATOR
- OMIT = 120 VAC, 60 Hz
- W + Voltage Hz = For all other AC
- W110R = DC sol. with 110 VAC rectifier, requires "Z5L" plug option
- G + Voltage = All other DC

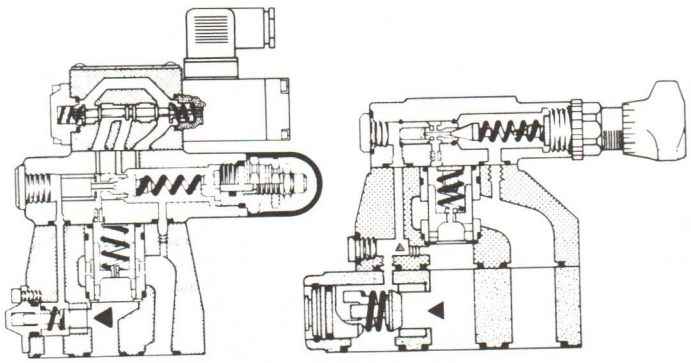
MANUAL OVERRIDE

ELECTRICAL CONNECTIONS
- Z4 = Std. plug-in
- Z5 = Large plug-in
- Z5L = Large plug-in w/ind. lts.

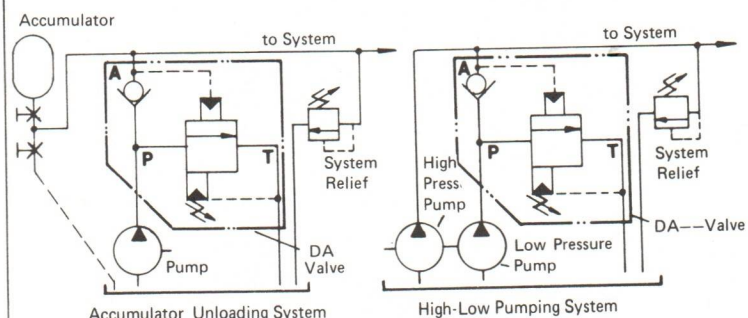
SEALS
- OMIT = Buna-N
- V = Viton

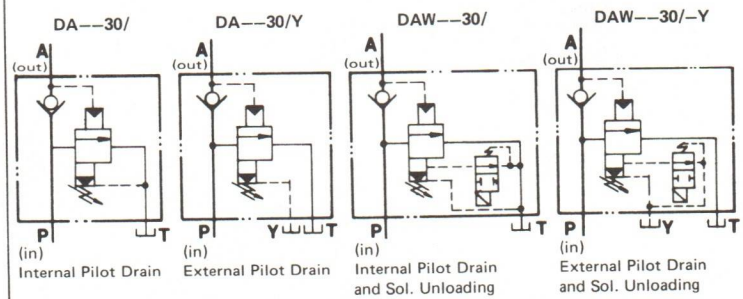
Technical Data

Pressure Rating	4500 psi (315 bar)		
Pressure Drop	Before reloading - approx. 17%		
Flow Size 10 (1/2")	10 GPM (40 l/min)		
Size 20 (1")	26 GPM (100 l/min)		
Size 30 (1-1/2")	65 GPM (250 l/min)		
Stability/Repeatability	+ 1% of set pressure and + 10 psi (0.7 bar)		
Max. Adjusting Screw Torque	20 lb/ins. (2.3 nm)		
Response Time	20 milliseconds		
Operating Temperature	-40°F (-20°C) to +160°F (+70°C)		
Seals, Standard	Buna-N, compatible with petro. based hyd. fluids		
Optional	Viton, compatible with most phosphate esters		
Viscosity Range	35 SSU (2.8cSt) to 1750 SSU (380cSt)		
Weight,	Valve Size 10	20	30
Type DA, lbs (kg)	8.4 (3.8)	17 (7.7)	30 (13.4)
Type DAW, lbs (kg)	11.0 (4.9)	19 (8.8)	32 (14.5)
Subplate, lbs (kg)	4 (1.7)	11 (5.2)	18 (8.2)



Ordering Code/schematics



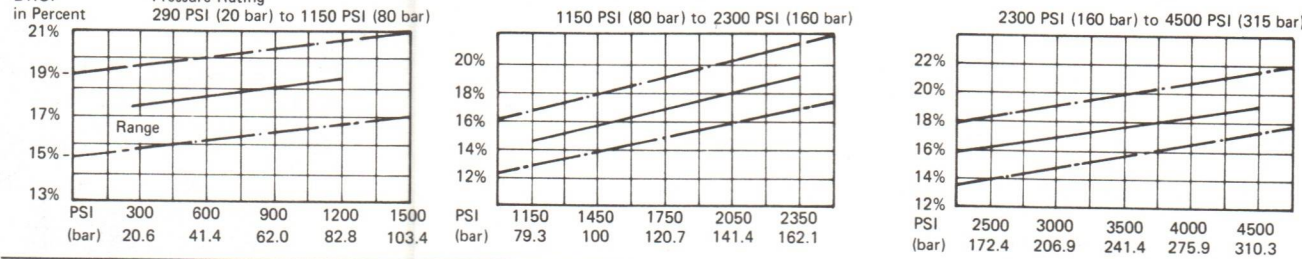


PERFORMANCE CURVES measured with 168 SSU (36cSt) and temperature of 122°F (50°C)

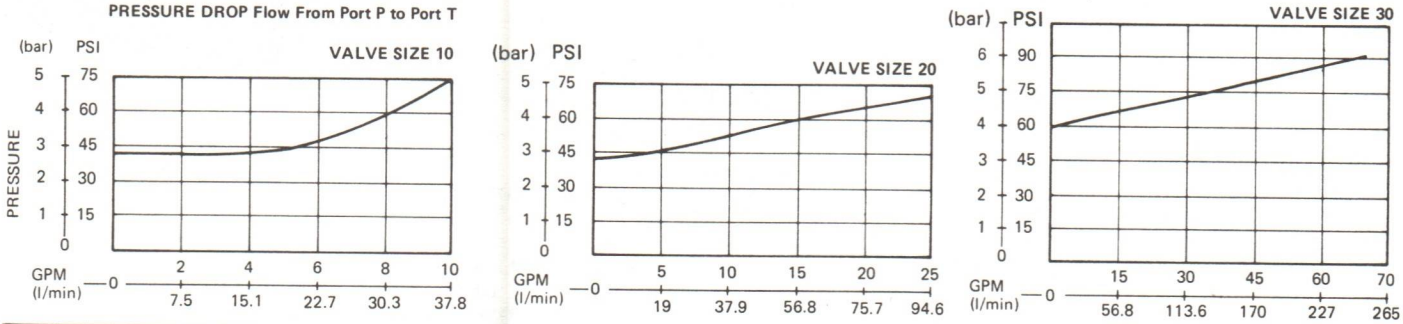
Charts show a percentage variation as found from valve to valve. These variations are the result of manufacturing fit between the pilot body and the control piston.

PERCENTAGE OF SYSTEM PRESSURE

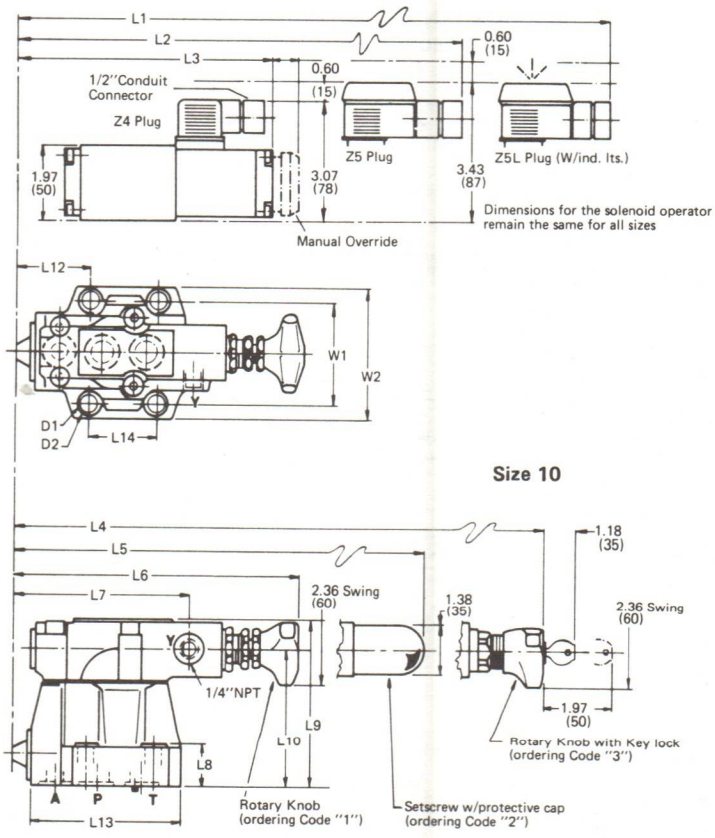
Loss required to shift the valve from port T to Port A, and to rebuild the system pressure.

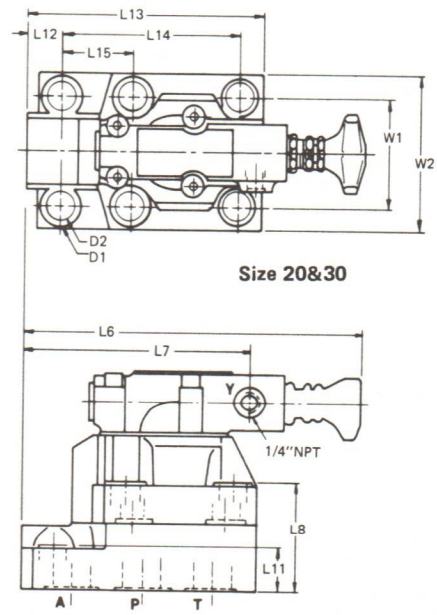


PRESSURE DROP Flow From Port P to Port T



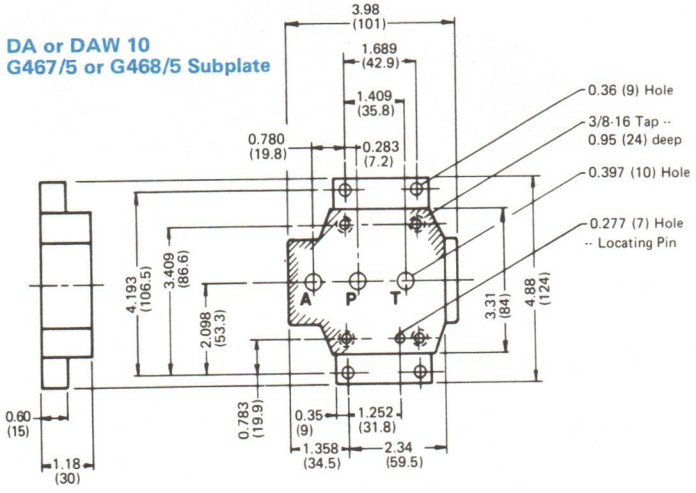
Dimensional Data, Size 10 thru 30





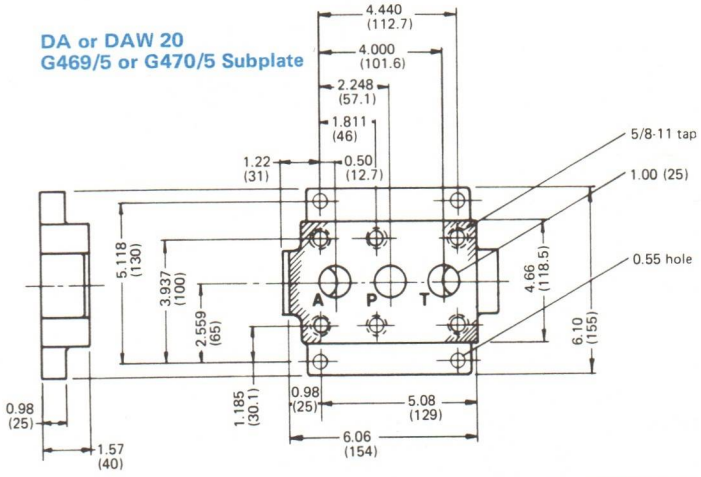
VALVE SIZE	DIMENSIONS, inches (mm)																		
	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	W1	W2	D1	D2
10	6.30 (160)	6.30 (160)	6.06 (154)	7.80 (198)	6.77 (172)	7.80 (198)	4.45 (113)	1.10 (28)	4.40 (112)	3.62 (92)		1.85 (47)	3.78 (96)	1.68 (42)		2.62 (66)	3.35 (85)	.709 (18)	0.43 (11)
20	7.64 (194)	7.64 (194)	7.40 (188)	9.13 (232)	8.15 (207)	9.13 (232)	5.79 (147)	2.83 (72)	5.67 (144)	4.88 (124)	1.10 (28)	0.98 (25)	6.06 (154)	4.44 (112)	1.811 (46)	2.75 (70)	3.98 (101)	1.025 (26)	0.70 (18)
30	8.70 (221)	8.70 (221)	8.50 (216)	10.08 (256)	9.09 (231)	10.08 (256)	6.73 (171)	3.66 (93)	6.50 (165)	5.71 (145)	1.77 (45)	1.65 (42)	7.83 (199)	5.50 (139)	2.00 (50)	3.25 (82.5)	4.57 (116)	1.18 (30)	0.78 (18)

DA or DAW 10
G467/5 or G468/5 Subplate



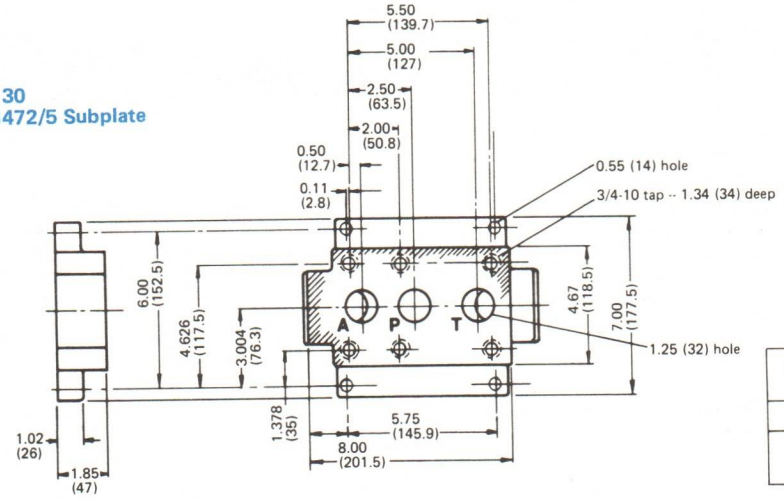
Subplate		Mounting Screws	Tightening Torque	Weight
G467/5	3/8 NPT	Socket Head Capscrews 3/8–16 UNC x 2	51 lb. ft. (69 Nm)	3.75 lbs. (1.7 kg.)
G468/5	1/2 NPT			

DA or DAW 20
G469/5 or G470/5 Subplate



Subplate		Mounting Screws	Tightening Torque	Weight
G469/5	3/4 NPT	Socket Head Capscrews 4 5/8–11 x 4" 2 5/8–11 x 2"	216 lb. ft. (295 Nm)	12 lbs. (5.2 kg.)
G470/5	1" NPT			

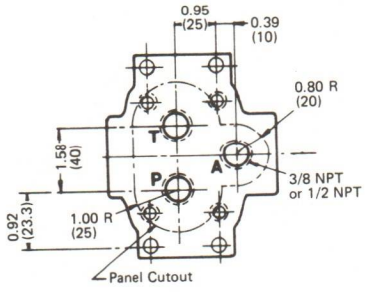
DA or DAW 30
G471/5 or G472/5 Subplate



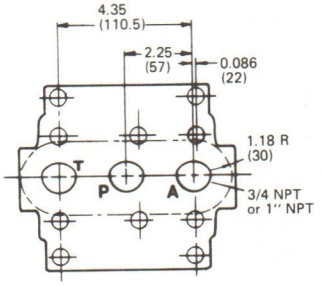
Subplate		Mounting Screws	Tightening Torque	Weight
G471/5	1 1/4 NPT	Socket Head Cap Screws 4 3/4–10 x 4 3/4 2 3/4–10 x 3	300 lb. ft. (405 Nm)	18 lbs. (8.2 kg.)
G472/5	1 1/2 NPT			

Panel Cut-Outs for mounting of subplates

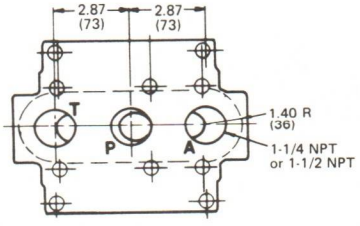
DA or DAW 10
G467/5 or G468/5 Subplate



DA or DAW 20
G469/5 or G470/5 Subplate



DA or DAW 30
G471/5 or G472/5 Subplate



PressureControls

The DRDP Series Pressure Reducing Valves are a direct operated spool-type design with built-in by-pass check; subplate mounted only. These valves are typically used to lower the operating pressure in a secondary circuit.

Four operating pressure ranges of 350, 1,000, 2,000 and 3,000 PSI are available. Adjustment of the pressure setting can be achieved via a set screw, or rotary handknob, of which a lockable version is also available. Handknob adjustment is available only for pressure ratings of 350 and 1,000 PSI. A scale is provided on the valve to allow repetition of the required pressure setting.

The selected pressure can be locked with an axially arranged set screw on all models.

Direct Operated Pressure Reducing Valve

up to 3000 PSI
up to 12 GPM

Type DRDP, Size 6-1/4" & 10-1/2"

Refer to **RA 26565** for Size 6
Refer to **RA 26582** for Size 10

Ordering Code

DR 10 DP 1 – XX / 150 Y M V

SIZE
- 6 = 1/4" (ANSI D01)
- 10 = 1/2" (ANSI P03)

ADJUSTMENT
- 1 = Handwheel
- 2 = Screw w/protective cap
- 3 = Key lock

DESIGN SERIES

MAX. OPERATING PRESSURE
- 25 = 350 PSI
- 75 = 1000 PSI
- 150 = 2000 PSI
- 210 = 3000 PSI

OPTIONS
- OMIT = Int. pilot int. drain
- X = Ext. pilot int. drain
- Y = Int. pilot ext. drain
- XY = Ext. pilot ext. drain

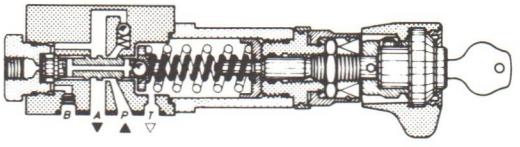
OMIT = With built-in check
M = Without built-in check

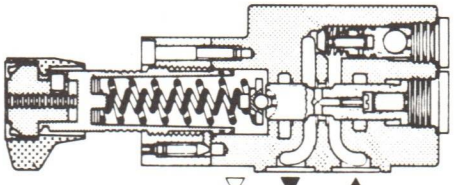
SEALS
- OMIT = Buna-N
- V = Viton

Technical Data

Max. Operating Pressure At The Outlet Port	3,000 PSI (210 bar)	
Maximum Inlet Pressure	5,000 PSI (315 bar)	
Maximum Back Pressure At Port "T"	Size 6	Size 10
	900 PSI 60 bar	200 PSI 15 bar
Maximum Flow	8 GPM 30 l/min	12 GPM 45 l/min
Fluid Recommendation	Petroleum Based Hyd. Fluids	
Temperature Range	-40°F (-20°C) to +160°F (+70°C)	
Viscosity Range	35 SSU (2.8cSt) to 1750 SSU (380cSt)	

Size 6





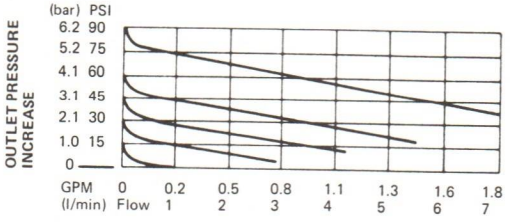
Size 10

Performance curves (measured at v = 36cSt and t = 50° C)

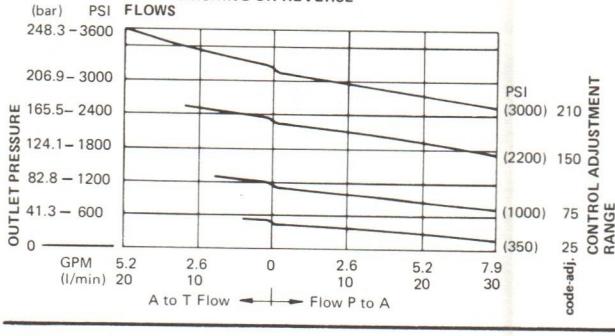
Size 6

OUTLET PRESSURE INCREASES AS THE FLOW DECREASES— (Add to Set Pressure)

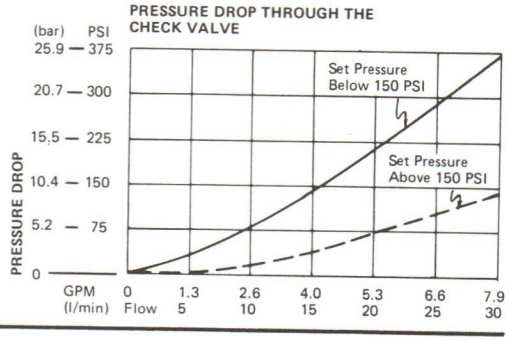
EXAMPLE:
1. The outlet pressure at Port A is set for 450 PSI (30 bar).
2. The flow is 1.8 GPM (7 l/min).
3. The outlet pressure at Port A increases to 525 PSI (36 bar).
4. Because of a flow decrease to near zero.



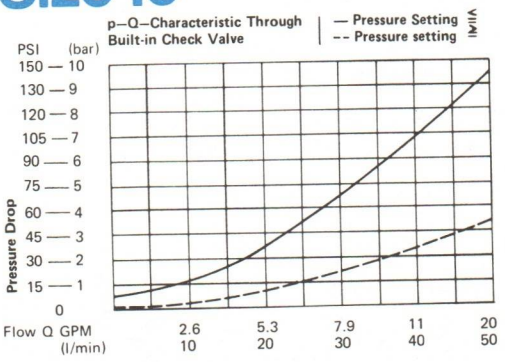
PRESSURE CHANGE DUE TO DIMINISHING OR REVERSE FLOWS

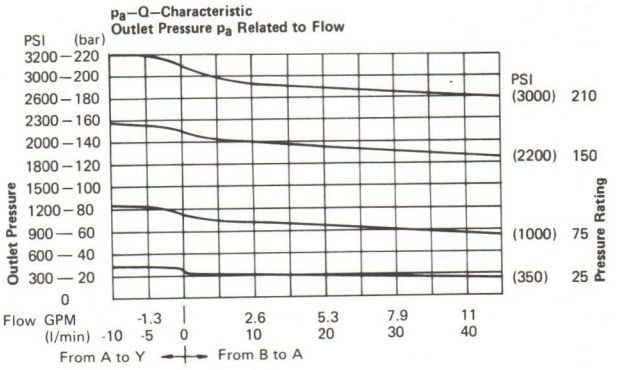


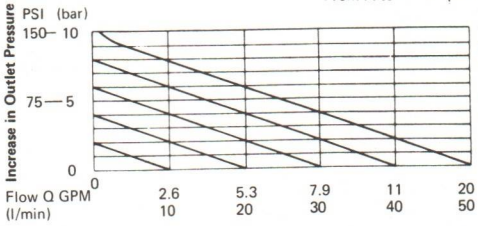
PRESSURE DROP THROUGH THE CHECK VALVE



Size 10





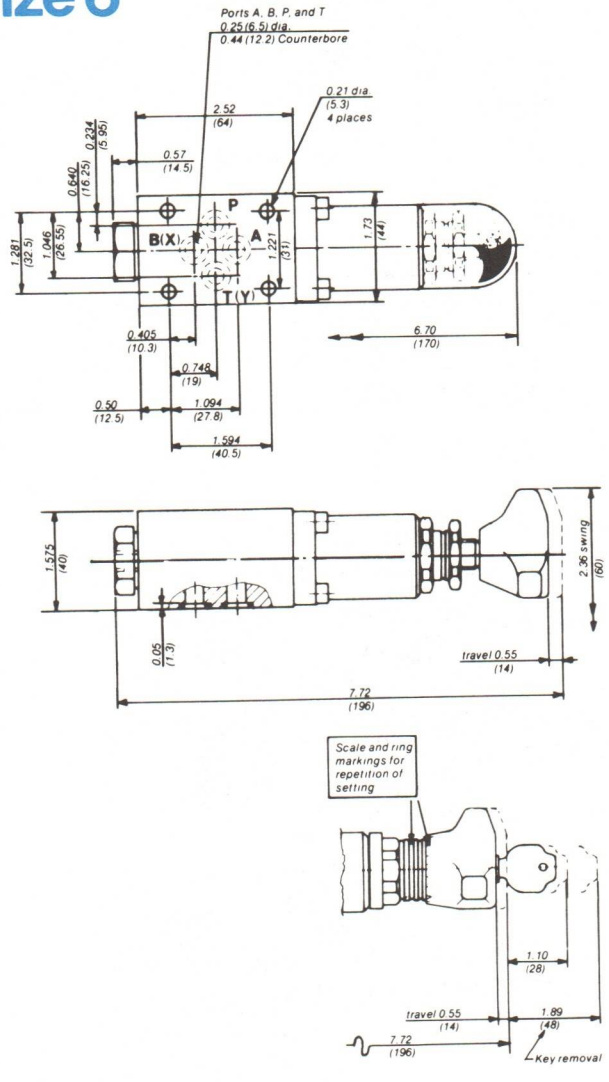


p_a min–Q–Characteristic →

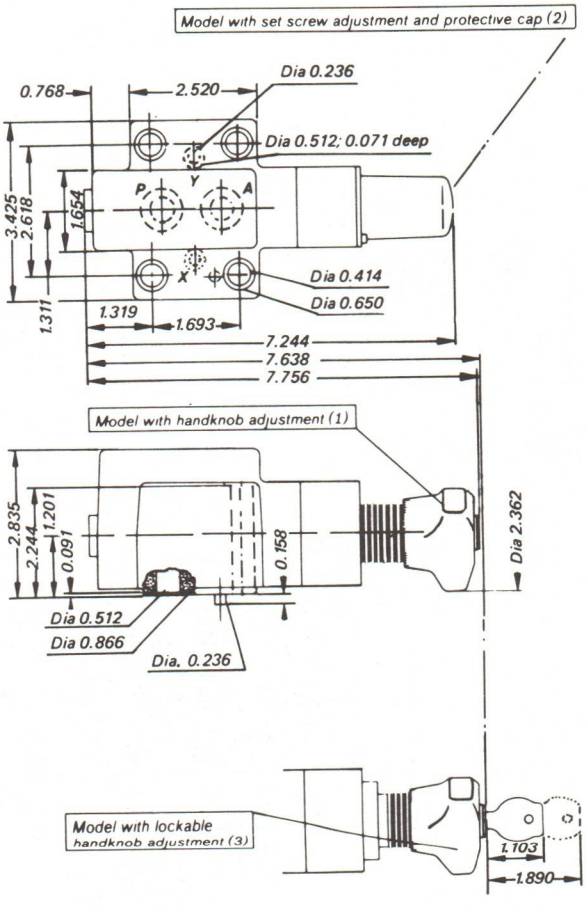
The course of the curve is maintained relative to the pressure rating when pressure setting is lower.

The p_a min–Q–characteristic shows the minimum pressure setting in relation to flow B A.

Size 6

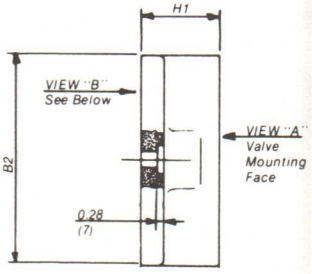


Size 10

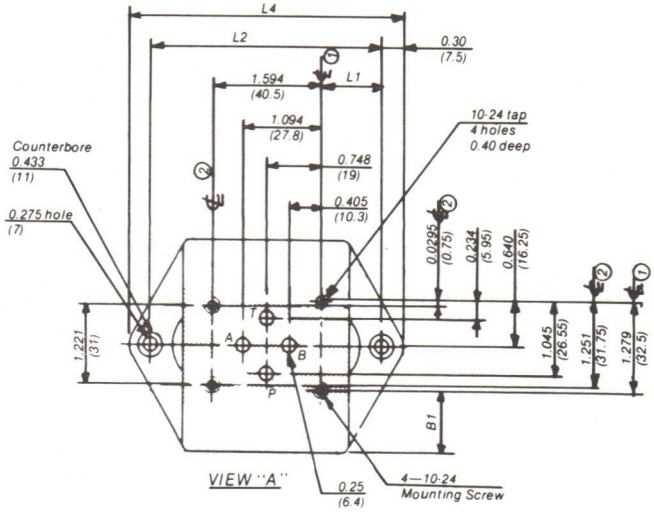


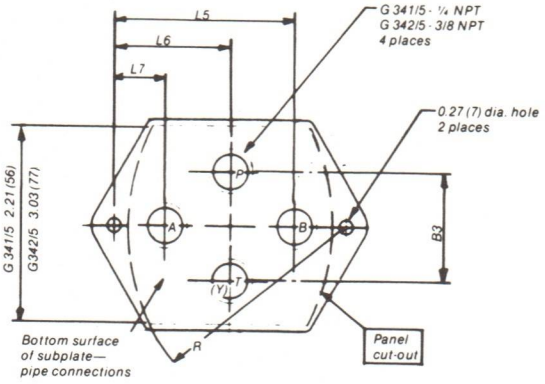
Size 6

ANSI DO1 Mounting Pattern



DIMENSION in inches (mm)

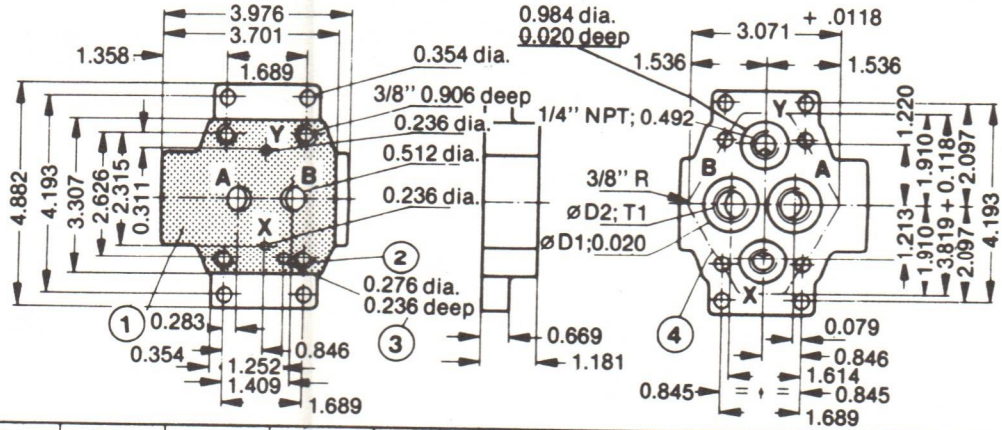




Subplate	Mounting Screws	Tightning Torque	Weight
G 341/5	Socket Head Cap Screws 10-24 x 2"	4.4 lb. ft. (6 Nm)	2.2 lbs. 1 Kg.
G 342/5			

Subplate	B1	B2	B3	L1	L2	L4	L5	L6	L7	H1	R Rad.	
G 341/5	0.50 (12.7)	2.28 (58)	1.34 (34)	0.827 (21)	3.150 (80)	3.74 (95)	2.284 (58)	1.575 (40)	0.87 (22)	0.984 (25)	2.76 (70)	
G 342/5	0.93 (23.7)	3.15 (80)	1.73 (44)	1.023 (26)	3.543 (90)	4.13 (105)	2.717 (69)	1.772 (45)	0.827 (21)	1.18 (30)	3.35 (85)	

Size 10

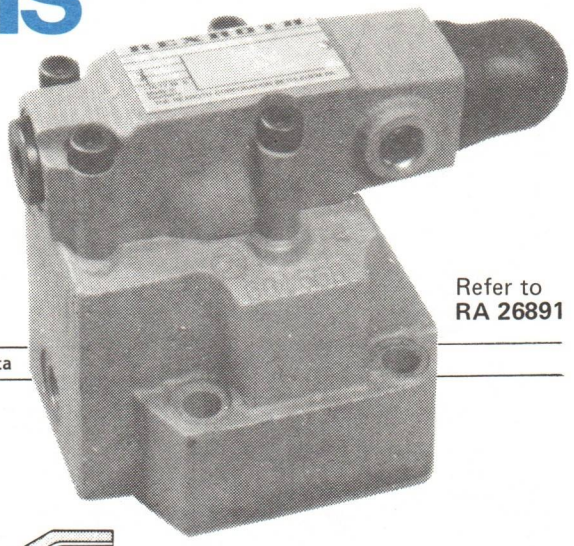


Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
10	G 460/1	1.102	3/8"	0.492	4 3/8" x 2 1/4" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	4 lbs.
	G 461/1	1.339	1/2"	0.571			

PressureControls

Pressure control valves type DR are pilot operated pressure reducing valves.
They are used to reduce pressure in a system. Pressure reducing valves comprise mainly a pilot valve with pressure setting element, main valve with main spool insert, fixed flow controller and optional check valve.

Pilot Operated Pressure Reducing Valve Series 30



TypeDR
Size10-1/2"to30-1 1/2"

up to 4500 psi
up to 79 GPM

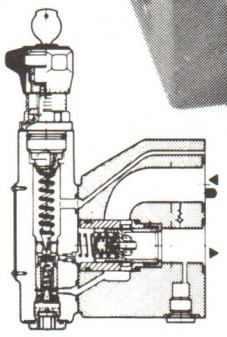
Refer to **RA 26891**

Ordering Code

DR OMIT 30 3 – XX/ 315Y V / 5

- **OMIT** = Complete valve
  - T = Remote valve only
  - C = Pilot valve only
  - C + SIZE = Pilot and cartridge
- **SIZE**
  - 10 = 1/2" (ANSI P03)
  - 20 = 3/4" (ANSI P06)
  - 30 = 1-1/2" (ANSI P10)
- **ADJUSTMENT**
  - 1 = Handwheel
  - 2 = Screw w/protective cap
  - 3 = Key lock
- **DESIGN SERIES**
- **MAXIMUM OPERATING PRESSURE**
  - 100 = 1500 PSI
  - 315 = 4500 PSI
- **SEALS**
  - Omit = Buna-N
  - V = Viton

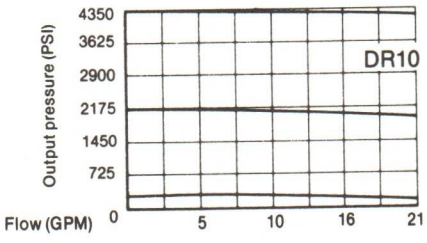
Technical Data

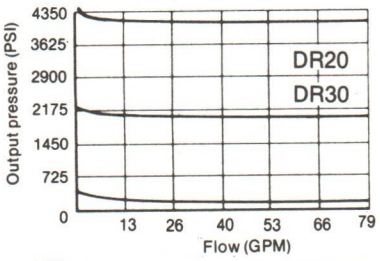


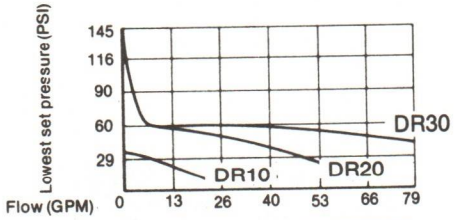
Size	10	20	30
Flow, Threaded Conns. (GPM)	21	53	80
Hydraulic Medium	Mineral oils; phosphate ester		
Fluid Temperature Range	-4 to 160°F		
Viscosity Range	35 to 1750 SSU		
Set Pressure	Up to 1450 PSI or 4500 PSI		
Input Pressure Range (Port B)	Up to 5000 PSI		
Output Pressure Range (Port A)	44 - 4500 PSI	145 - 4500 PSI	
Backpressure (Port Y)	Up to 4500 PSI		

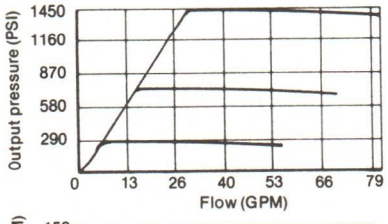
For applications to other specifications, please consult us.

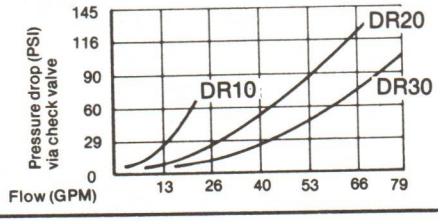
Performance Curves (measured at ν = 167.7 ssu and t = 120°F).

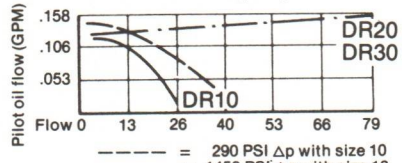




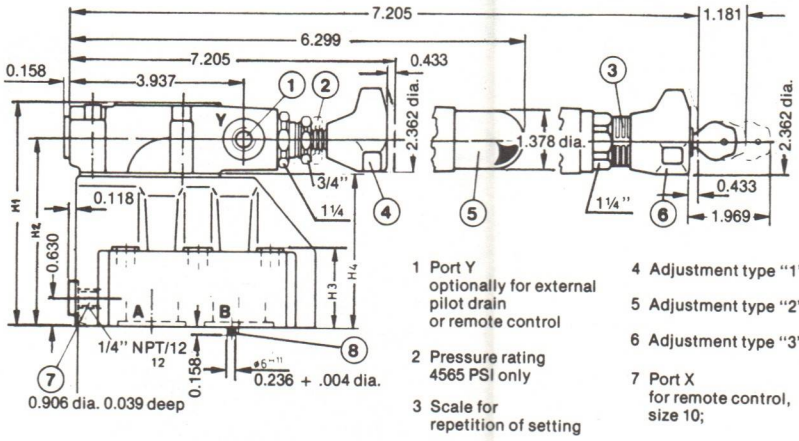








– – – – = 290 PSI Δp with size 10
——— = 1450 PSI Δp with size 10
= 290 PSI and 1450 PSI Δp with sizes 20 & 30



1 Port Y optionally for external pilot drain or remote control

2 Pressure rating 4565 PSI only

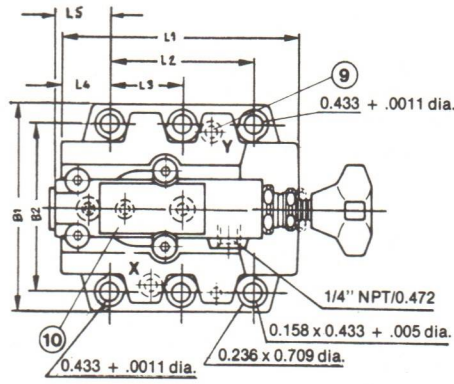
3 Scale for repetition of setting

4 Adjustment type "1"

5 Adjustment type "2"

6 Adjustment type "3"

7 Port X for remote control, size 10;

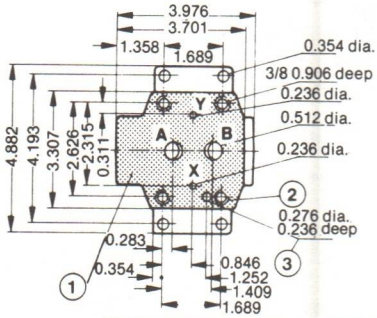


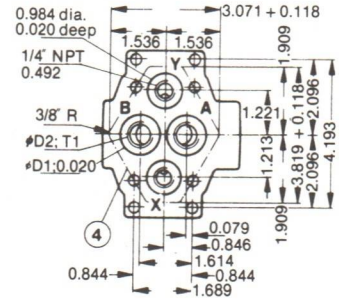
Size	B1	B2	H1	H2	H3	H4	L1	L2	L3	L4	L5	O-ring port X, Y	O-ring ports A, B	Weight
10	3.346	2.626	4.409	3.622	1.102	2.835	3.543	1.689	—	1.398	1.358	2-012	2-115	8 lbs
20	4.016	3.126	4.803	4.016	1.496	3.228	4.409	2.374	—	1.319	1.457	2-012	2-216	12 lbs
30	4.724	3.811	5.118	4.331	1.811	3.543	5.512	3.315	1.657	1.102	1.232	2-012	2.220	18 lbs

8 Locating pin

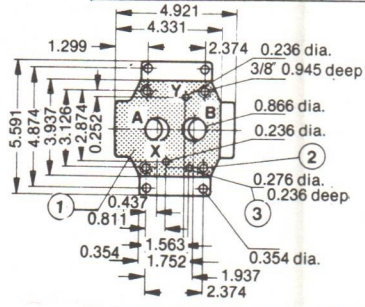
9 Port Y optional pilot drain

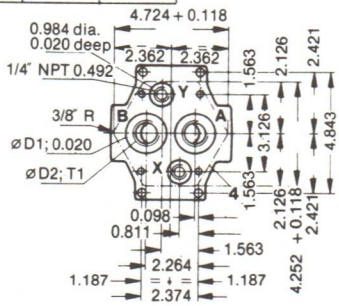
10 Nameplate



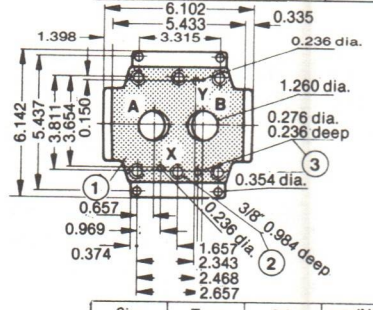


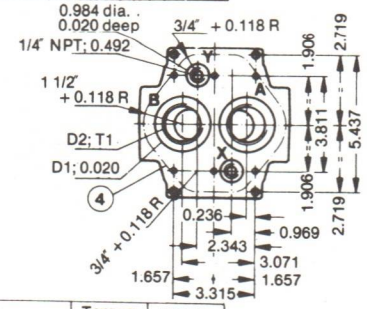
Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
10	G 460/1	1.102	3/8"	0.492	4 3/8" x 1 1/2" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	4 lbs.
	G 461/1	1.339	1/2"	0.571			





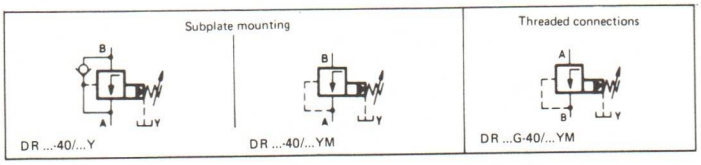
Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
20	G 412/1	1.654	3/4"	0.650	4 3/8" x 2 1/2" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	7 lbs.
	G 413/1	1.850	1"	0.768			





Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
30	G 414/1	2.205	1 1/4"	0.807	6 3/8" x 2 1/2" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	11 lbs.
	G 415/1	2.402	1 1/2"	0.886			

PressureControls



Pilot Operated Pressure Reducing Valve Series 40

up to 4500 PSI
up to 21 GPM

TypeDR Size 10 - 1/2" to 30 - 1 1/2"

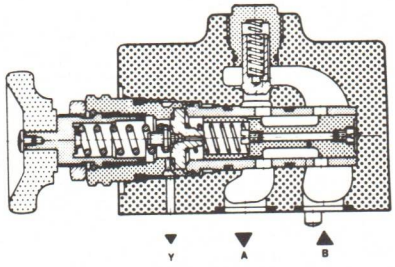
Refer to RA 26893

Ordering Code

DR OMIT 20 5 – XX/ 315Y M V / 5

- **OMIT** = Complete valve
  - T = Remote valve only
  - C = Pilot valve only
  - C + SIZE = Pilot and cartridge
- **SIZE**
  - 10 = 1/2" P03
  - 15 = 3/4" NPT
  - 20 = 1" P06
- **MOUNTING**
  - Omit = Subplate
  - G = Threaded
  - K = Cart. (20 only)
- **ADJUSTMENT**
  - 4 = Handwheel
  - 5 = Screw w/protective cap
  - 6 = Key lock
- **DESIGN SERIES**
- **MAXIMUM OPERATING PRESSURE**
  - 50 = 750 PSI
  - 100 = 1500 PSI
  - 200 = 3000 PSI
  - 315 = 4500 PSI
- **OPTIONS**
  - Omit = With check valve
  - M = Without check valve
- **SEALS**
  - OM = Buna-N
  - V = Viton

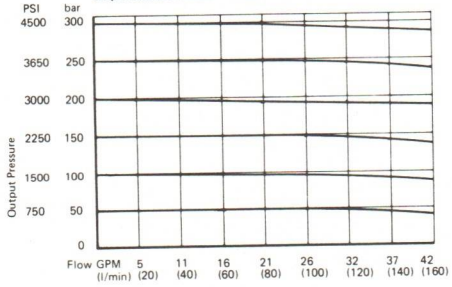
Technical Data

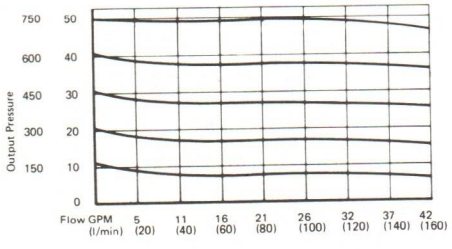


Size	10	20
Hydraulic Medium	Mineral Oils; Phosphate Ester	
Fluid Temperature Range	-40°F (-20°C) to +170°F (70°C)	
Viscosity Range	35 SSU (2.8cSt) to 1750 SSU (380cSt)	
Pressure Setting	Up to 750, 1500, 3000 and 4500	
Input Pressure Range (Port B)	Up to 4500 PSI (315 bar)	
Output Pressure Range (Port A)	145 to 4500 PSI (10 to 315 bar)	
Backpressure (Port Y)	Up to 3700 PSI	
Flow Threaded Connections	21 GPM (80 l/min)	42 GPM (160 l/min)
Flow Subplate Mounting	21 GPM (80 l/min)	

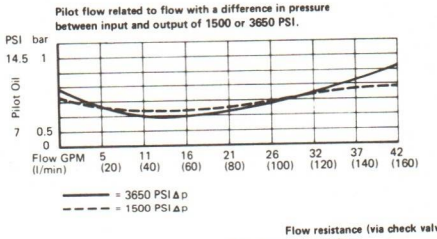
Performance Curves (measured at ν = 170 SSU(36cSt) and 122°F(50°C)

Output Pressure Related To Flow

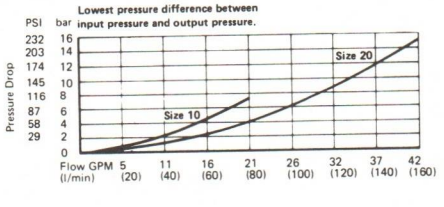




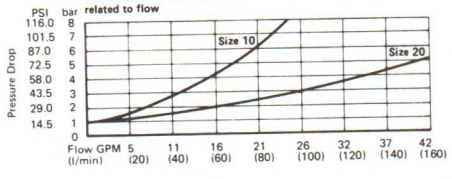
Pilot flow related to flow with a difference in pressure between input and output of 1500 or 3650 PSI.



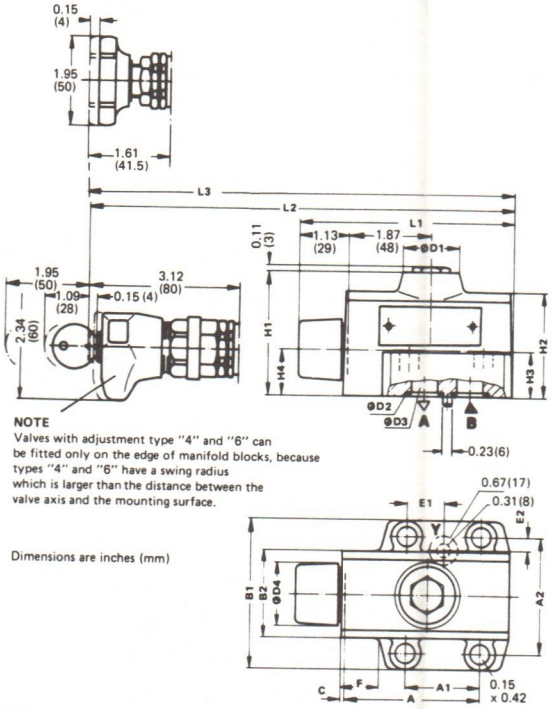
Lowest pressure difference between input pressure and output pressure.



Flow resistance (via check valve) related to flow



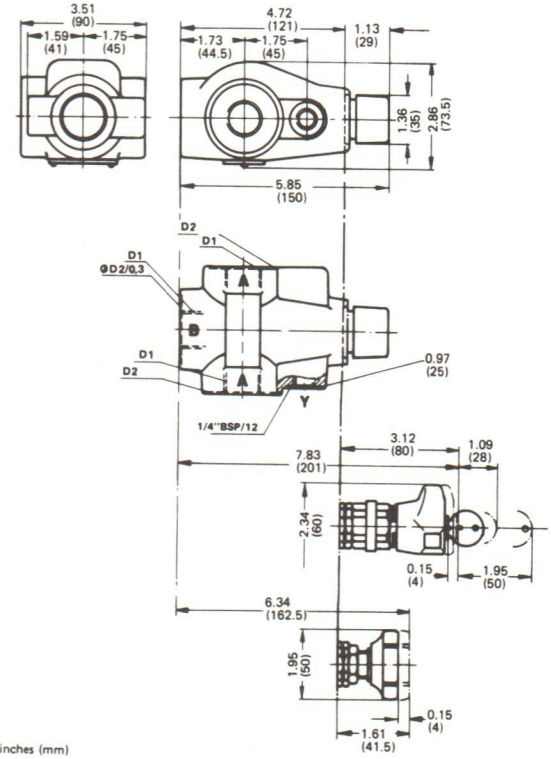
TypeDR



Dimensions are inches (mm)

Size	A	A1	A2	B1	B2	C	D1	D2	D3	D4	E1	E2	F
10	3.08 (79)	1.67 (42.9)	2.60 (66.7)	3.31 (85)	1.91 (49)	0.09 (2.5)	1.26 (32.5)	0.85 (21.8)	0.58 (15)	1.36 (35)	0.83 (21.5)	0.30 (7.9)	0.89 (23)
20	3.10 (79.5)	2.35 (60.3)	3.09 (79.4)	3.9 (100)	2.26 (58)	0.15 (4)	1.59 (41)	1.35 (34.8)	0.9 (25)	1.36 (35)	1.54 (39.7)	0.24 (6.4)	0.27 (7)

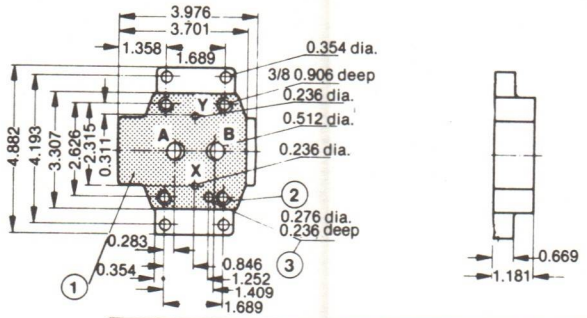
Size	H1	H2	H3	H4	L1	L2	L3	Weight	
10	2.76 (71)	2.34 (60)	1.01 (26)	1.01 (26)	4.85 (124.5)	6.84 (175.5)	5.34 (137)	4.8 lbs.	
20	3.74 (96)	3.04 (78)	1.01 (26)	1.56 (40)	4.87 (125)	6.86 (176)	5.36 (137.5)	7.0 lbs.	

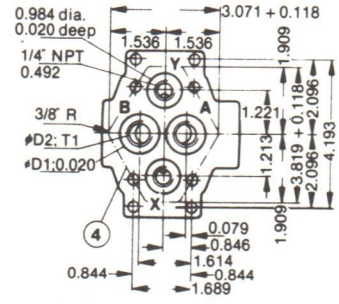


Dimensions: inches (mm)

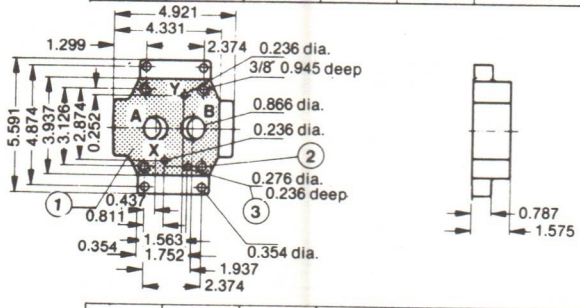
Valve Type	D1	D2
DR 10 G	1/2" BSP	1.32 (34)
DR 15 G	3/4" BSP	1.63 (42)
DR 20 G	1" BSP	1.83 (47)

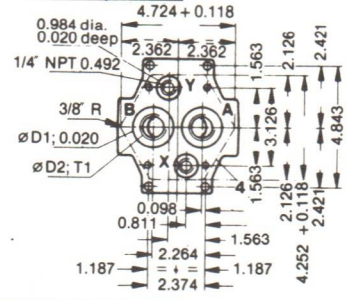
Dimensional Data, Subplates





Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
10	G 460/1	1.102	3/8"	0.492	4 3/8" x 1 1/2" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	4 lbs.
	G 461/1	1.339	1/2"	0.571			





Size	Type	D1	D2 (NPT)	T1	Valve fixing screws	Torque	Weight
20	G 412/1	1.654	3/4"	0.650	4 3/8" x 2 1/2" DIN 912 - 10.9 (must be ordered separately)	49 Ft. lbs.	7 lbs.
	G 413/1	1.850	1"	0.768			

PressureControls

ZDR6D Type pressure reducing valves are direct operated, sandwich design and are generally mounted between a four way valve and a subplate. See diagrams below for the flow and pressure configurations. Some models are available with a return check valve.

Type ZDR10D is a direct operated spool type valve of three way design, i.e. with pressure control of the secondary circuit.

The valves are available in four pressure ratings of 350, 1000, 2000 and 3000 PSI. The maximum pressure setting is 3000 PSI. According to the model, the setting of the secondary pressure is adjusted by means of a set screw or handknob, the latter also being available with safety lock. The handknob adjustment is available only for the pressure ratings 350 and 1000 PSI.

up to 3000 PSI
up to 12.5 GPM

Type ZDR, Size 6-1/4" & 10-1/2"

Size 6 RA 26569
Size 10 RA 26583

Direct Operated Pressure Reducing Valve

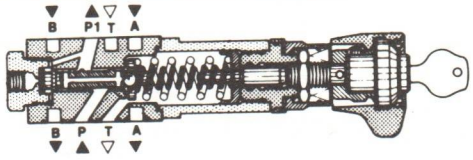
Ordering Code

ZDR 10 D A 1 – XX / 150 Y M V

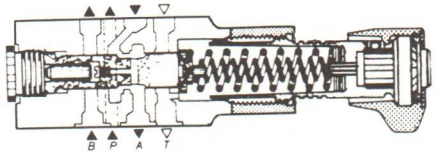
- **SIZE**
  - 6 = 1/4" (ANSI D01)
  - 10 = 1/2" (ANSI D02)
- **REDUCING PORT**
  - A = Reducing in 'A' port
  - P = Reducing in 'P' port
- **ADJUSTMENT**
  - 1 = Handwheel
  - 2 = Screw w/protective cap
  - 3 = Key lock
- **DESIGN SERIES**
- **MAXIMUM OPERATING PRESSURE**
  - 25 = 350 psi
  - 75 = 1000 psi
  - 150 = 2000 psi
  - 210 = 3000 psi
- **OMIT** = With built-in check
  - M = Without built-in check
- **SEALS**
  - OMIT = Buna - N
  - V = Viton

Technical Data

Size 6



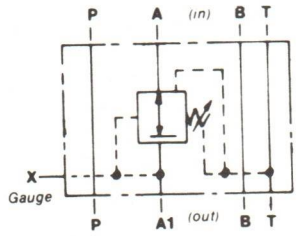
Size 10



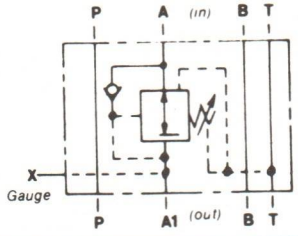
PRESSURE RATING	4500 PSI (315 bar) inlet
ADJUSTMENT RANGE	to 3000 PSI (210 bar)
MAXIMUM FLOW	8 GPM (30 l/min), Size 6
	12.5 GPM (45 l/min), Size 10
MAXIMUM PRESSURE AT PORT T	850 PSI (60 bar), Size 6
	220 PSI (15 bar), Size 10
STABILITY & REPEATABILITY	±1% of set pressure & ±10 PSI (0.7 bar)
MAX. ADJUSTING SCREW TORQUE	20 lb.-inches (2.3 nm)
RESPONSE TIME	20 milliseconds
OPERATING TEMPERATURE	-4°F(-20°C) + 160°F(+70°C)
VISCOSITY RANGE	35 SSU (2.8cSt) to 1750 SSU (380 cSt)
WEIGHT	Valve: 2.6 lbs (1.2 kg), Size 6
	Subplate: 2.2 lbs (1 kg)
	Valve 6.8 lbs (3.09 kg), Size 10

Schematics, Size 6

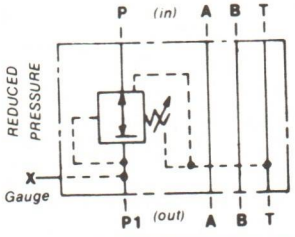
VALVE MODEL (no return check)
ZDR6DA....-30/....YM



VALVE MODEL (with return check)
ZDR6DA....-30/....Y

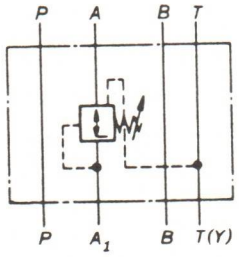


VALVE MODEL
ZDR6DP....-30/....Y...

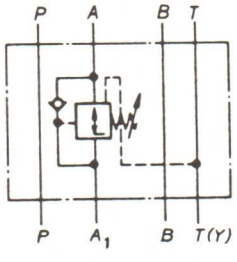


Schematics, Size 10

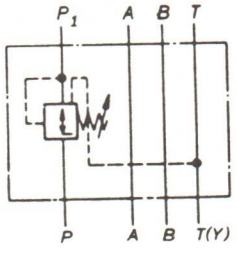
Type: ZDR 10 DA...YM...



Type: ZDR 10 DA...Y...

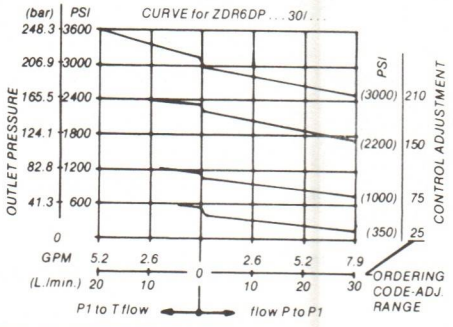


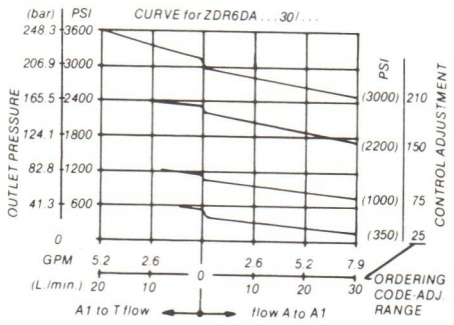
Type: ZDR 10 DP...YM...



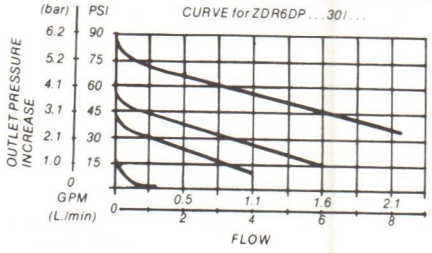
Size 6

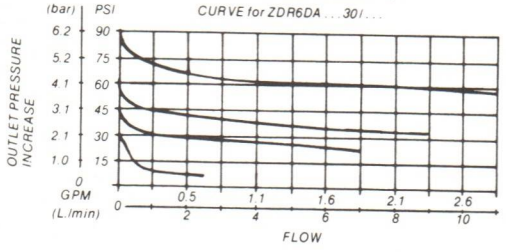
PRESSURE CHANGE due to DIMINISHING or REVERSE FLOWS





OUTLET PRESSURE INCREASE as the FLOW DECREASES— (add to set Pressure)



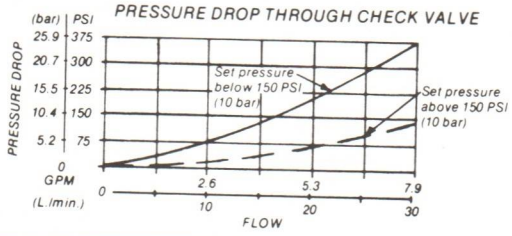


OUTLET PRESSURE INCREASE as the FLOW DECREASES— (add to set Pressure)

EXAMPLE:

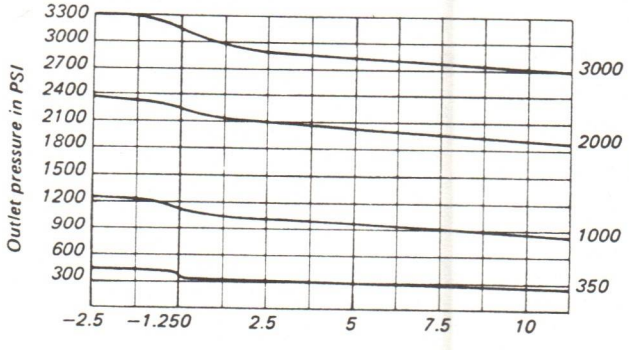
1. the Outlet Pressure at Port A1 or P1 is set at 450 PSI (30 bar).
2. the flow is 2.6 GPM (10 L./min.)
3. the Outlet Pressure at Port A1 or P1 increases to 525 (36 bar).
4. because of a flow decrease to near zero.

PRESSURE DROP THROUGH CHECK VALVE



Size 10

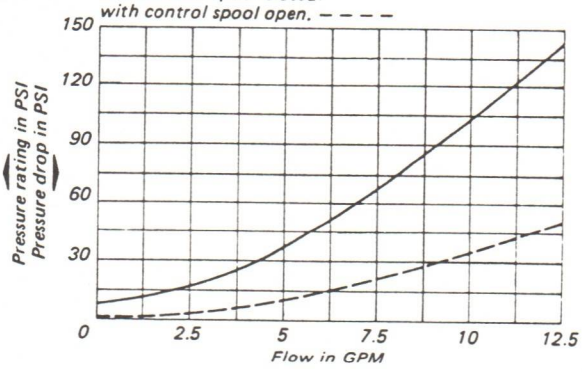
p_a – Q – Characteristic
Outlet pressure p_a related to flow

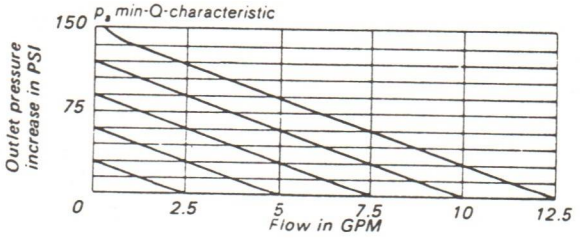


From A_1 to T (Y) From A to A_1
Flow in GPM
At lower pressure settings the course of the curve is maintained relative to the pressure rating.

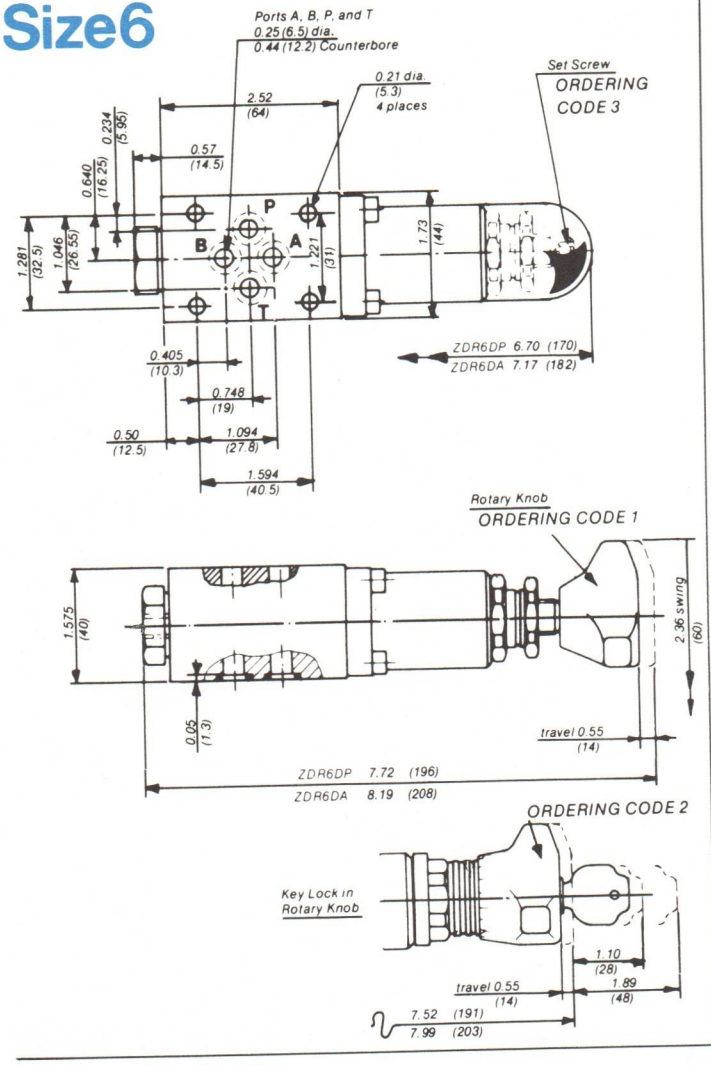
The p_a min-Q-characteristic shows the minimum pressure setting related to flow B → A.
If, for example, the pressure at port A is set at **450 PSI** at a flow of **5 GPM**, with a decrease in flow to around zero the outlet pressure increases to **500 PSI.**

Flow resistance through check valve: —— with control spool closed:
with control spool open. – – – –

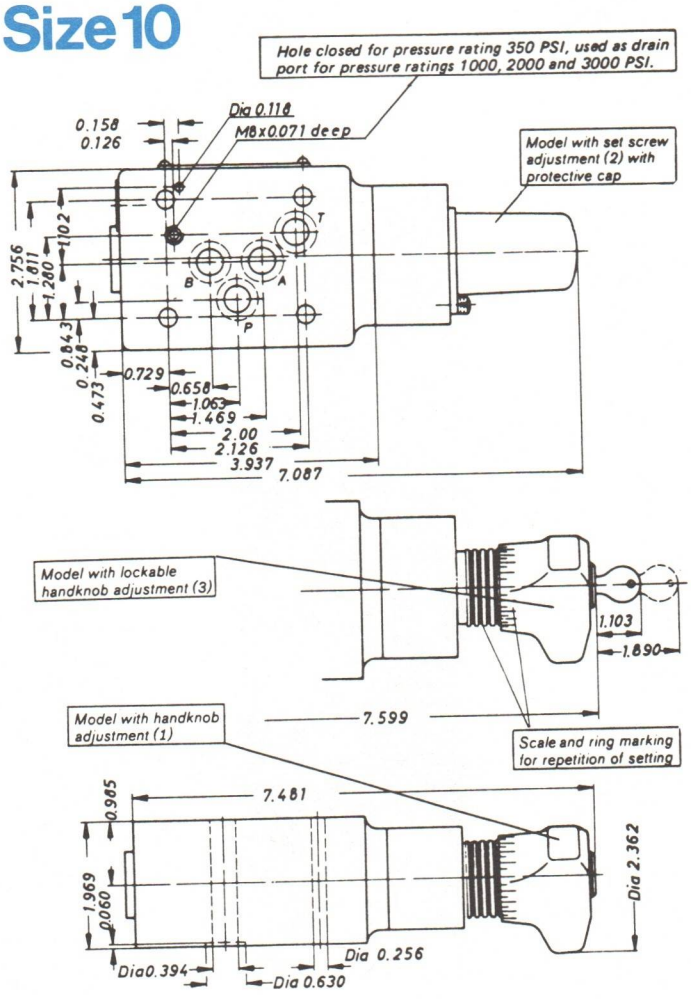




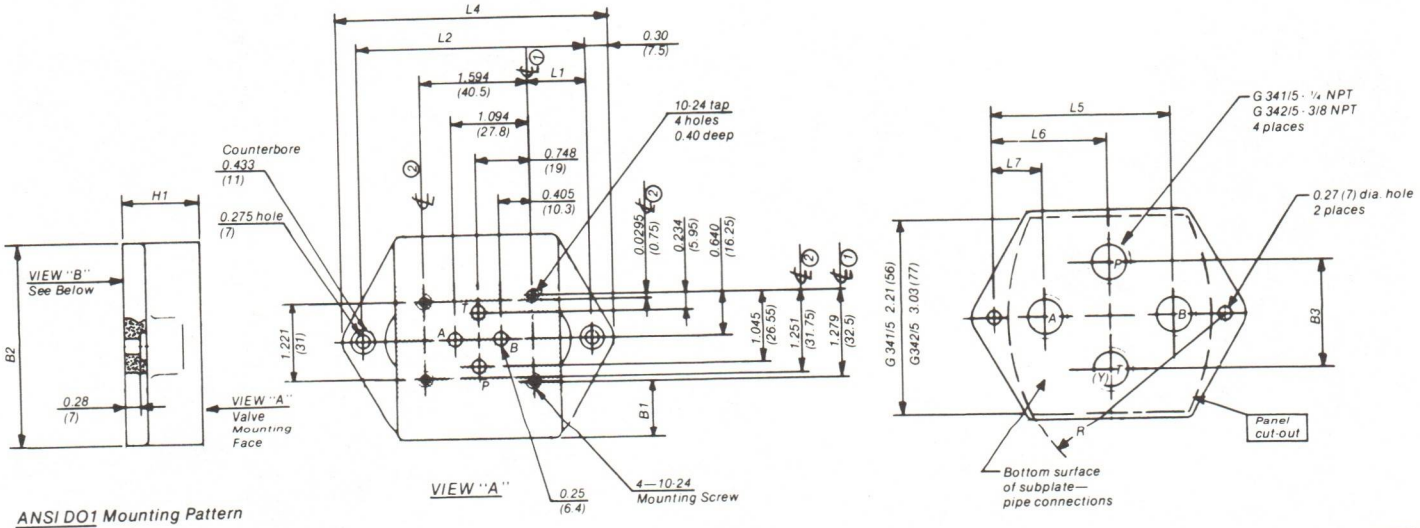
Size6



Size10



Dimensional Data, Subplates



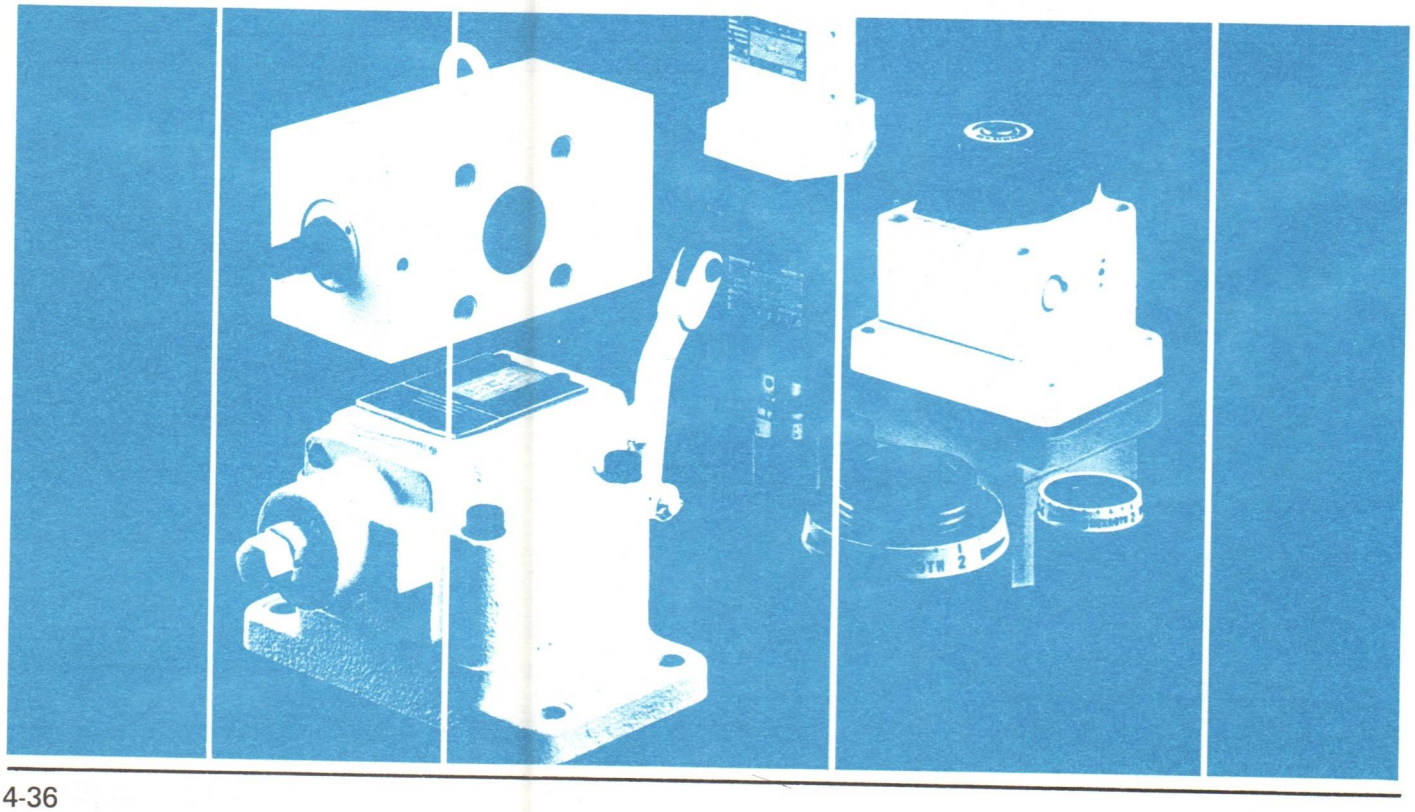
ANSI DO1 Mounting Pattern

Subplate	Mounting Screws	Tightning Torque	Weight
G 341/5	Socket Head Cap Screws 10-24 x 2"	4.4 lb. ft. (6 Nm)	2.2 lbs. 1 Kg.
G 342/5			

Subplate	B1	B2	B3	L1	L2	L4	L5	L6	L7	H1	R Rad.
G 341/5	0.50 (12.7)	2.28 (58)	1.34 (34)	0.827 (21)	3.150 (80)	3.74 (95)	2.284 (58)	1.575 (40)	0.87 (22)	0.984 (25)	2.76 (70)
G 342/5	0.93 (23.7)	3.15 (80)	1.73 (44)	1.023 (26)	3.543 (90)	4.13 (105)	2.717 (69)	1.772 (45)	0.827 (21)	1.18 (30)	3.35 (85)

Summary | FLOW CONTROLS

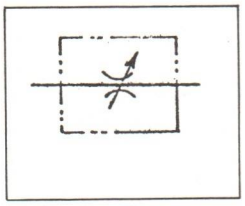
TYPE	REXROTH CODE	DESIGN	SIZE/CAPABILITY	PAGE NO.
FLOW CONTROL VALVES	DV	Needle In-line (NPT or SAE) Subplate (ANSI)	1/2" thru 1-1/2" up to 93 GPM 5000 PSI	5-1 to 5-3
	DRV	Needle w/By-Pass Check In-Line (NPT or SAE) Subplate (ANSI)	1/2" thru 2" up to 93 GPM (Controlled) up to 158 GPM (Free Flow) 5000 PSI	5-1 to 5-3
	MK	In-Line w/By-Pass Check (NPT)	3/4" thru 1-1/2" up to 106 GPM 5000 PSI	5-4
	Z2FS	Sandwich w/By-Pass Check	1/4" (D01) thru 1" (D06) up to 80 GPM 5000 PSI	5-5 to 5-7
	2FRM	Subplate (Temp/Pressure Compensated)	1/8", 1/2" (2F02) and 3/4" (2F03) up to 38 GPM (Controlled) up to 48 GPM (Free Flow) 5000 PSI	5-8 to 5-10
	2FRH/2FRHF P 2FRW/2FRWF P 2FRE	Subplate (Temp/Pressure Compensated) For Remote Control	1/2" (2F02) and 3/4" (2F03) up to 38 GPM 5000 PSI	5-11 & 5-12
	MK/MG	Flanged or Manifold	2-1/2" thru 4" up to 800 GPM 5000 PSI	5-13



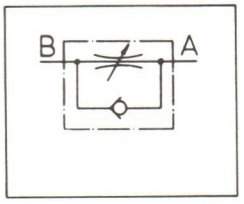
FlowControls

For DV Types, Refer to **RA 32502**
For DRV Types, Refer to **RA 32552**

This valve is an in-line adjustable flow control valve to control the fluid flow in either direction. It has a bar stock body which is available with either NPT or SAE straight thread, or manifold mounted models. The valve incorporates a slotted needle to provide an accurate control of the flow. By turning of the control knob counterclockwise, the flow increases uniformly. A color coded rising stem, is provided to indicate the position of the valve opening. This visible indicator permits repeatable valve setting. A set screw is provided in the hand knob to lock the setting.



Type DV & DVP



Type DRV & DRVP

Type DV

Type DV & DRV, Size 8-1/4 to 40-2"

Ordering Code

D_V_ 8 1. X/5 V S

VALVE TYPE & MOUNTING

DV	=	Inline	Without By-pass Check
DVP	=	Subplate	
DRV	=	Inline	With By-pass Check
DRVP	=	Subplate	

SIZE

	NPT	SAE
8 =	1/4"	7/16 –20
10 =	3/8"	9/16 –18
12 =	1/2"	3/4 –16
16 =	3/4"	1-1/16 –12
20 =	1"	1-5/16 –12
25 =	1-1/4"	1-5/8 –12
30 =	1-1/2"	1-7/8 –12
*40 =	2"	2-1/2 –12

STEEL BODY

DESIGN SERIES

CONNECTIONS

5 = NPT
12 = SAE

VITON SEALS

OPTIONS

S = Panel mount
OMIT = If not required

*Type DRV/DRVP only

Technical Data, all models

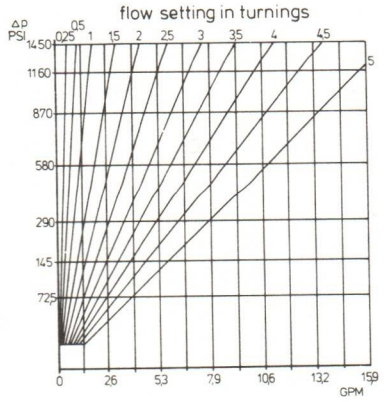
OPERATING PRESSURE	5000 PSI (350 bar)
FLOW RATING	See Pressure Flow Charts
OPERATING TEMPERATURE	-40°F (-20C) to +212°F (+100C)
FLUID RECOMMENDATIONS	These valves are supplied as a standard with Viton seals. Viton seals are compatible with most hydraulic fluids.
VISCOSITY RANGE	35 SSU(2.8cSt) to 1750 SSU(380cSt)
MOUNTING POSITION	Optional
WEIGHT	See Installation Dimension Chart

Performance Data, Type DV

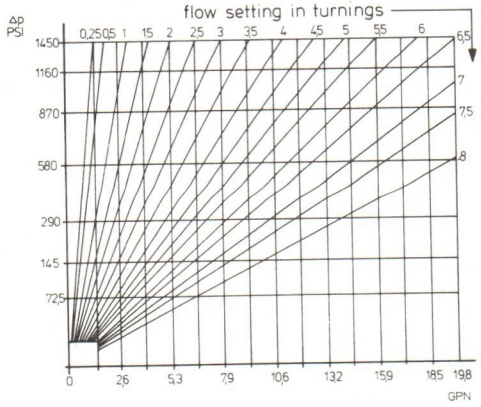
Type DV

NOMINAL FLOW RATE
Test performed with hydraulic oil 122°F (50°C) and 165 SSU (35cSt.)

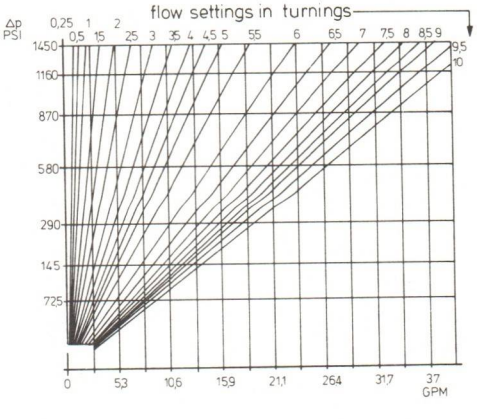
Types: DV/DVP-8



Types: DV/DVP-10



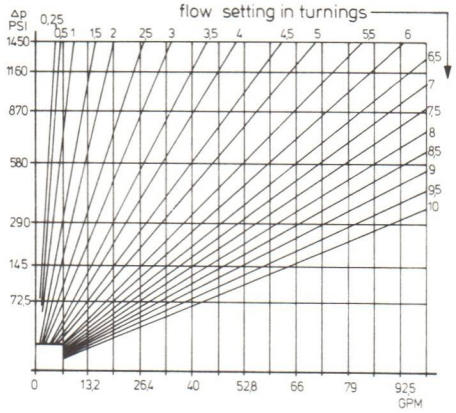
Types: DV/DVP-12



Type DV

Types: DV/DVP-16

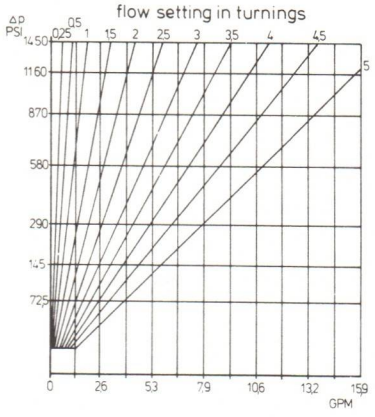
Types: DV/DVP-20/25/30



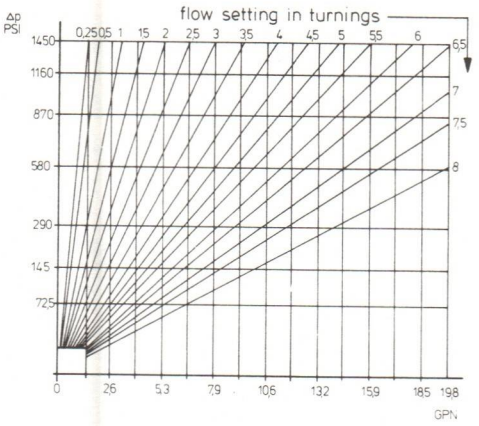
Type DRV

NOMINAL FLOW RATE
Test performed with hydraulic oil 122°F (50°C) and 165 SSU (35cSt.)

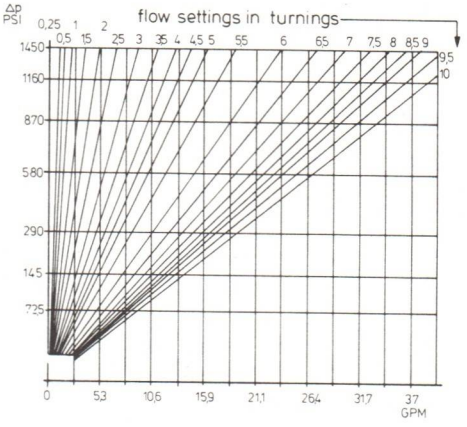
Types: DRV/DRVP - 8



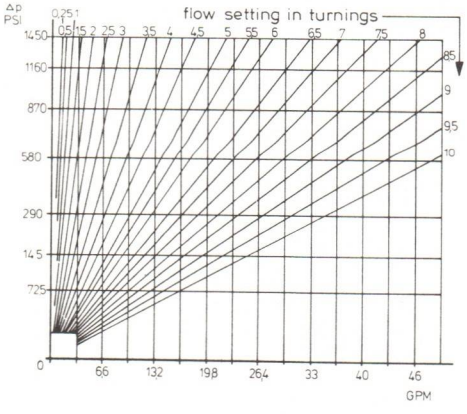
Types: DRV/DRVP - 10



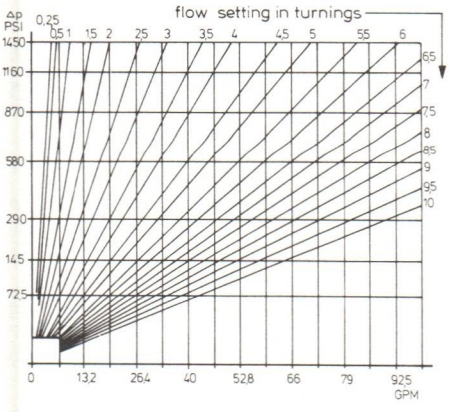
Types: DRV/DRVP - 12



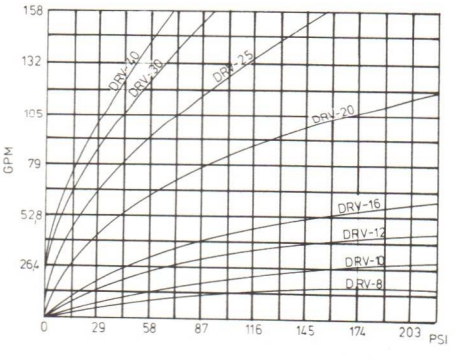
Types: DRV/DRVP - 16



Types: DRV/DRVP - 20/25/30/40



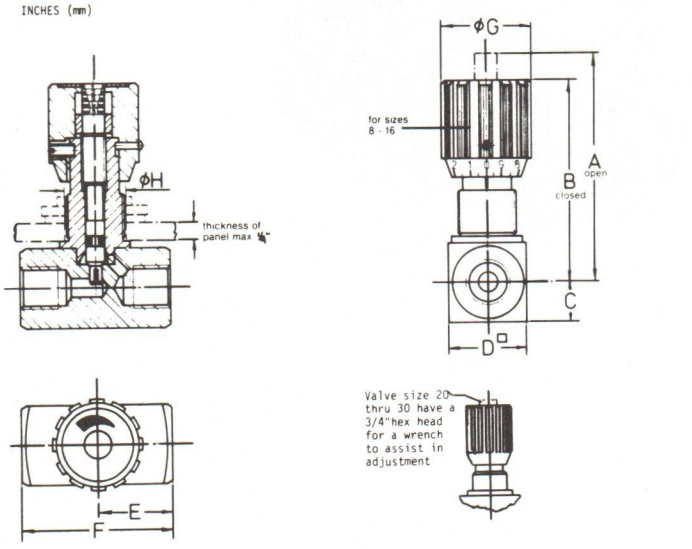
Flow direction: B → A
Δp curves free flow



TypeDV

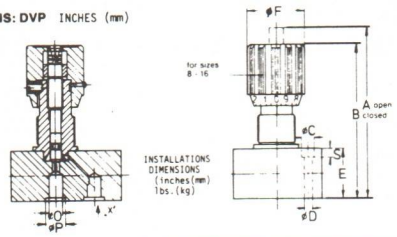
Dimensions in inches (mm), weight in pounds (kg)

INSTALLATION DIMENSIONS
INCHES (mm)

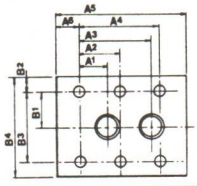


VALVE SIZE	SAE Thread Dash No.	A	B	C	D sq	E	F	G dia.	H dia.	Weight
8 1/4"	- 4	2.83(72)	2.56(65)	0.49(12.5)	0.98(25)	0.94(24)	1.89(48)	1.14(29)	0.75(19)	0.55(0.25)
10 3/8"	- 6	3.31(74)	2.64(67)	0.59(15)	1.18(30)	1.14(29)	2.28(58)	1.14(29)	0.75(19)	0.88(0.4)
12 1/2	- 8	3.62(92)	3.23(82)	0.69(17.5)	1.38(35)	1.34(34)	2.68(68)	1.50(38)	0.91(23)	1.54(0.7)
16 3/4	- 12	4.17(106)	3.78(96)	0.88(22.5)	1.77(45)	1.54(39)	3.07(78)	1.50(38)	0.91(23)	2.65(1.2)
20 1"	- 16	5.71(145)	5.04(128)	0.98(25)	1.97(50)	2.13(54)	4.25(108)	1.93(49)	1.50(38)	4.63(2.1)
25 1 1/4	- 20	5.91(150)	5.24(133)	1.18(30)	2.36(60)	2.13(54)	4.25(108)	1.93(49)	1.50(38)	6.17(2.8)
30 1 1/2	- 24	6.10(155)	5.43(138)	1.38(35)	2.76(70)	2.13(54)	4.25(108)	1.93(49)	1.50(38)	7.72(3.5)

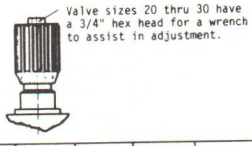
INSTALLATION DIMENSIONS: DVP INCHES (mm)
ANSI STANDARDS



Valve Size	A	B	C	D	E	F	O	P	S	Weight
8 1/4	3.11(79)	2.83(72)	0.43(11)	0.26(7)	0.79(20)	1.14(29)	0.28(7)	0.50(13)	0.28(7)	0.9(2)
10 3/8	3.31(84)	3.03(77)	0.43(11)	0.26(7)	0.98(25)	1.14(29)	0.39(10)	0.62(16)	0.28(7)	1.3(2.9)
12 1/2	3.90(99)	3.50(85)	0.43(11)	0.26(7)	0.98(25)	1.50(38)	0.51(13)	0.74(19)	0.28(7)	2.2(4.9)
16 3/4	4.45(113)	4.06(103)	0.55(14)	0.35(9)	1.18(30)	1.50(38)	0.67(17)	0.96(24)	0.35(9)	3.8(8.4)
20 1"	6.50(165)	5.83(148)	0.55(14)	0.35(9)	1.77(45)	1.93(49)	0.87(22)	1.20(30)	0.35(9)	8.0(18)
25 1 1/4	6.50(165)	5.83(148)	0.71(18)	0.43(11)	1.77(45)	1.93(49)	1.12(28)	1.48(38)	0.43(11)	12.1(27)
30 1 1/2	6.69(170)	6.02(153)	0.79(20)	0.55(14)	1.97(50)	1.93(49)	1.38(35)	1.71(44)	0.51(13)	16.5(36)



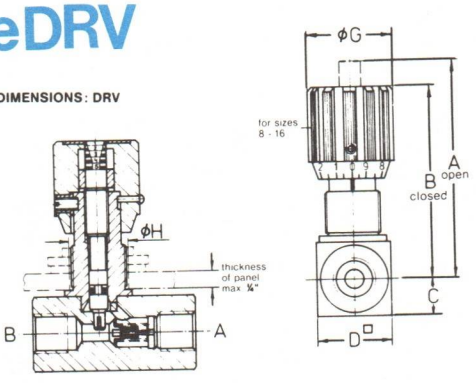
MANIFOLD DIMENSIONS
(inches and mm)



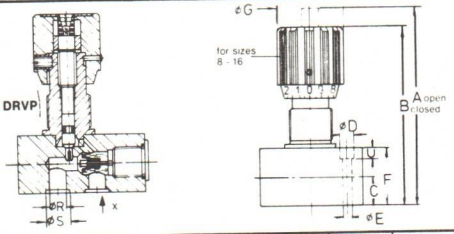
Valve Size	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4
8 1/4	0.18(5)	---	1.02(26)	1.38(35)	1.87(48)	0.26(7)	0.66(17)	0.25(6)	1.32(34)	1.81(46)
10 3/8	0.16(4)	---	1.16(30)	1.32(34)	2.08(53)	0.33(9)	0.75(19)	0.25(6)	1.50(38)	2.00(51)
12 1/2	0.16(4)	---	1.34(34)	1.50(38)	2.95(75)	0.73(19)	0.87(22)	0.25(6)	1.75(44)	2.25(56)
16 3/4	0.43(11)	1.50(38)	2.58(66)	2.99(76)	3.68(93)	0.33(9)	1.06(27)	0.31(8)	2.13(54)	2.75(70)
20 1"	0.75(19)	1.87(48)	2.99(76)	3.74(95)	4.37(111)	0.31(8)	1.18(30)	0.32(8)	2.36(60)	3.00(76)
25 1 1/4	0.83(21)	2.36(60)	3.96(101)	4.74(120)	5.63(143)	0.43(11)	1.50(38)	0.48(12)	2.99(76)	3.94(100)
30 1 1/2	0.95(24)	2.82(72)	4.69(119)	5.63(143)	6.73(171)	0.55(14)	1.81(46)	0.45(11)	3.62(92)	4.53(115)

TypeDRV

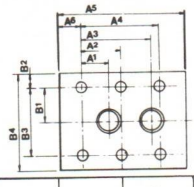
INSTALLATION DIMENSIONS: DRV

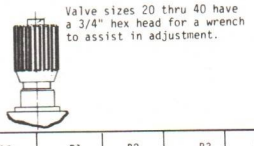


INSTALLATION DIMENSIONS: DRVP
ANSI STANDARDS



VALVE SIZE	A	B	C	D dia.	E dia.	F	O dia.	P dia.	S	Weight
8 1/4	3.13(80)	2.84(72)	0.39(10)	0.43(11)	0.27(7)	0.99(25)	0.18(5)	1.00(25)	0.50(13)	1.1(0.5)
10 3/8	3.34(85)	3.03(84)	0.50(13)	0.43(11)	0.27(7)	0.98(25)	0.16(4)	1.00(25)	0.62(16)	1.8(0.8)
12 1/2	4.19(106)	3.78(96)	0.63(16)	0.43(11)	0.27(7)	1.25(32)	0.16(4)	1.18(30)	0.73(19)	2.7(1.2)
16 3/4	5.03(128)	4.66(118)	0.88(22)	0.55(14)	0.35(9)	1.78(45)	0.45(12)	2.13(54)	0.96(24)	5.8(2.6)
20 1"	6.69(170)	6.03(153)	0.98(25)	0.55(14)	0.35(9)	1.97(50)	0.75(19)	2.24(57)	1.20(28)	8.6(3.9)
25 1 1/4	6.88(175)	5.91(150)	1.69(43)	0.71(18)	0.43(11)	2.16(56)	0.81(21)	3.13(80)	1.48(38)	13(5.9)
30 1 1/2	7.68(195)	6.69(170)	1.47(37)	0.79(20)	0.55(14)	2.97(75)	0.94(24)	3.74(95)	1.91(49)	20(9.1)
40 2"	8.66(220)	8.00(204)	1.97(50)	0.79(20)	0.55(14)	3.94(100)	1.00(25)	3.50(89)	2.26(57)	26(12)





Dimensions in inches (mm), weight in pounds (kg)

VALVE SIZE	SAE Dash No.	A	B	C	D sq.	E	F	G dia.	H dia.	Weight
8 1/4"	- 4	2.84(72)	2.56(65)	0.50(13)	0.98(25)	1.31(29)	2.16(55)	1.14(29)	0.75(19)	0.6(0.3)
8 1/4"	- 4	2.91(74)	2.63(67)	0.59(15)	1.19(30)	1.61(41)	2.56(65)	1.14(29)	0.75(19)	1.0(0.4)
10 3/8"	- 6	3.63(86)	3.25(83)	0.69(18)	1.38(35)	1.75(44)	2.88(73)	1.50(38)	0.91(23)	1.8(0.8)
12 1/2	- 8	4.17(106)	3.81(97)	0.88(22)	1.75(44)	2.25(57)	3.47(88)	1.50(38)	0.91(23)	2.8(1.3)
16 3/4	- 12	5.69(145)	5.03(128)	1.00(26)	1.97(50)	3.03(77)	5.00(127)	1.94(50)	1.50(38)	5.3(2.4)
20 1"	- 16	5.91(150)	5.25(134)	1.19(30)	2.38(60)	3.66(93)	5.63(143)	1.94(50)	1.50(38)	7.8(3.5)
25 1 1/4	- 20	6.13(156)	5.44(138)	1.38(35)	2.75(70)	4.25(108)	5.63(143)	1.94(50)	1.50(38)	10(4.5)
30 1 1/2	- 24	6.50(165)	5.81(148)	1.75(44)	3.53(90)	5.13(131)	6.50(165)	1.94(50)	1.50(38)	17(7.8)

VALVE SIZE	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4
8 1/4	0.38(10)	---	1.20(31)	1.38(35)	2.56(65)	0.56(14)	0.66(17)	0.25(6)	1.34(34)	1.81(46)
10 3/8	0.32(8)	---	1.16(30)	1.32(34)	2.89 (72)	0.70(16)	0.75(19)	0.25(6)	1.50(38)	2.00(51)
12 1/2	0.32(8)	---	1.34(34)	1.50(38)	3.31(84)	0.83(21)	0.87(22)	0.25(6)	1.75(44)	2.27(58)
16 3/4	0.88(22)	1.50(38)	2.56(65)	3.00(76)	4.25(108)	0.55(14)	1.06(27)	0.31(8)	2.13(54)	2.75(70)
20 1"	1.50(38)	1.87(48)	3.00(76)	3.75(95)	8.16(131)	0.63(16)	1.18(30)	0.31(8)	2.38(60)	3.00(76)
25 1-1/4	1.60(41)	2.36(60)	3.91(99)	4.73(120)	6.66(169)	0.59(15)	1.50(38)	0.47(12)	3.00(76)	3.94(100)
30 1-1/2	1.89(48)	2.82(72)	4.69(119)	5.63(143)	7.50(191)	0.59(15)	1.81(46)	0.45(11)	3.62(92)	4.53(115)
40 2"	1.75(45)	2.64(67)	4.25(108)	5.25(133)	7.72(196)	0.63(16)	2.19(56)	0.56(14)	4.38(111)	5.50(140)

FlowControls

MK Combined Throttle/Check Valve
up to 5000 psi
up to 106 GPM

The valves types MK 15 to 30 are pressure and viscosity dependent throttle/check valves.
In throttling direction oil flows to the rear of the valve poppet. Side bores allow the oil to flow to the throttling area formed between the housing and the adjustable sleeve. In the opposite direction the oil flow acts on the face of the check valve, the poppet is lifted from its seat, and oil flows unrestricted through the valve. At the same time a self-cleansing effect is obtained. The valves are designed for in-line mounting.

Sizes 15 - 3/4" to 30 - 1 1/2"

Refer to **RA 27 542**

Ordering Code

MK 20 G XX V / 5

VALVE TYPE
MK = With by-pass check

SIZE
15 = 3/4"
20 = 1"
25 = 1-1/4"
30 = 1-1/2"

CONNECTIONS
G = Inline (NPT)

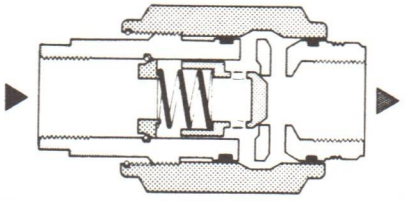
DESIGN SERIES

SEALS
OMIT = Buna - N
V = Viton

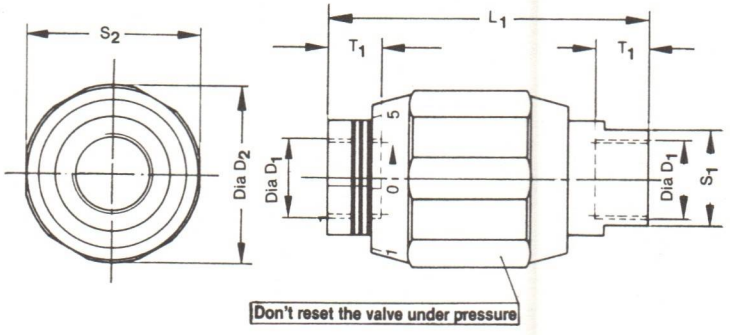
Technical Data

Hydraulic medium	Mineral oils
Fluid temperature range	-22°F to 176°F
Viscosity range	35 to 1750 SSU
Max. operating pressure	4500 PSI
Cracking pressure	7.5 PSI

Section



Dimensional Data

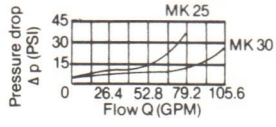


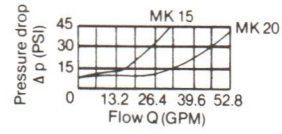
Size	D_1	D_2	L_1
15 (3/4")	3/4" NPT	2.283	3.937
20 (1")	1" NPT	2.835	4.331
25 (1 1/4")	1 1/4" NPT	3.425	5.118
30 (1 1/2")	1 1/2" NPT	3.661	5.905

Size	S_1	S_2	T_1	Weight (LBS)
15 (3/4")	1.260	2.165	0.630	2.4
20 (1")	1.614	2.756	0.709	4.2
25 (1 1/4")	1.968	3.346	0.787	7.0
30 (1 1/2")	2.362	3.543	0.866	9.0

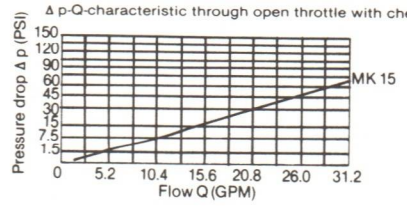
Performance Data

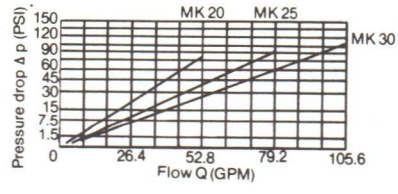
Δ p-Q-characteristic through open check valve with throttle closed





Δ p-Q-characteristic through open throttle with check valve closed





FlowControls

Refer to **RA 27505, RA 27517 RA 27527** and **RA 27537**

The double throttle/check valves type Z 2 FS serve to limit a main or pilot flow.

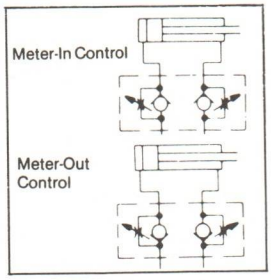
Two symmetrically arranged throttle/check valves limit flow by means of adjustable throttling spools in one direction and give free return flow in the other.

To adjust the speed of a user (main flow limiting) the double throttle/check valve is mounted directly between the directional control valve and subplate.

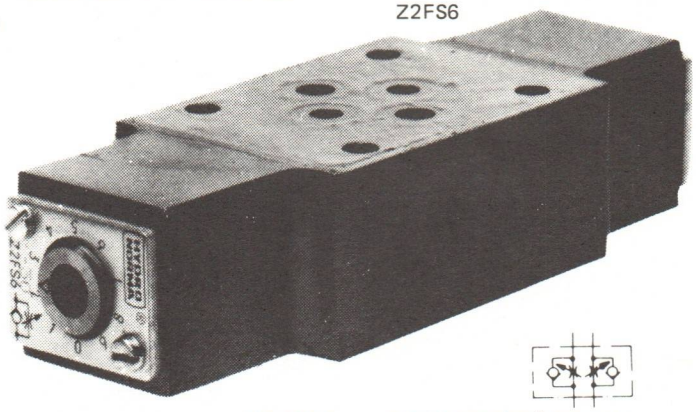
The valve can also be used as a pilot choke for pilot operated directional control valves (pilot flow limiting). In this case it is mounted between main valve and pilot. Adjustment is made by means of screws with visual scale.

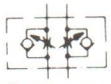
Meter-in or meter-out control is possible, according to the mounting position.

Double Throttle Check Valve Type Z 2FS6



Z2FS6





Size 6 thru 22

up to 5000 psi, up to 80 GPM

ANSI standard mounts

Ordering Code

Z2FS 10 – XX / S V

- **SIZE**
  - 6 = ANSI D01 - 3X
  - 10 = ANSI D02 - 2X
  - 16 = ANSI D04 - 3X
  - 22 = ANSI D06 - 3X
- **DESIGN SERIES**
- **CONTROL**
  - *S = Meter-in
  - *S2 = Meter-out
- **SEALS**
  - Omit = Buna-N
  - V = Viton

*on Size 16 & 22, specify "meter-in" or "meter-out"

Technical Data

Hydraulic medium	Mineral oils
Fluid temperature range	– 4 to + 160 ° F
Viscosity range	35 to 1750 SSU
Operating pressure range	up to 4500 PSI

Direction of Flow	The same for both valves; throttled in one direction, free flow over check valve in the other.

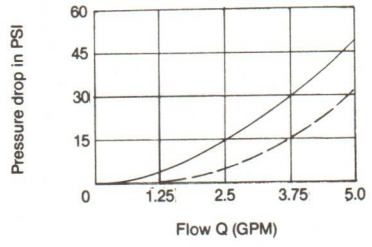
Weight: approx. 1.75 lbs.

Performance Curves

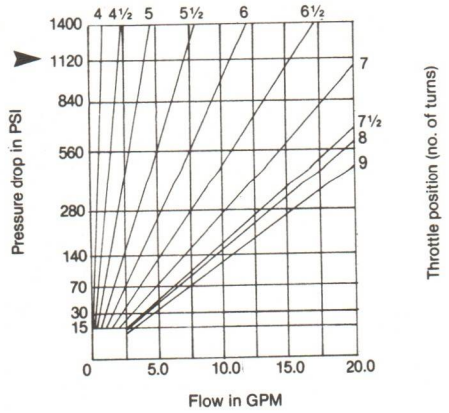
Z2FS6-1/4"

up to 5000 psi
D01 Mount
up to 20 GPM

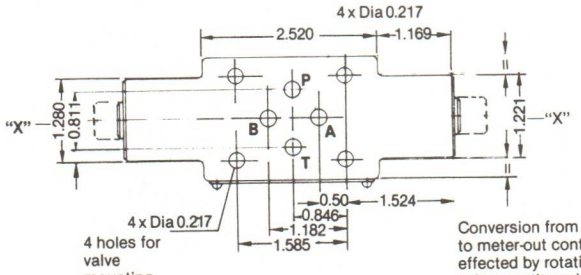
Pressure drop Δ p related to flow Q
— over check valve, throttle closed
-- over throttle, throttle open



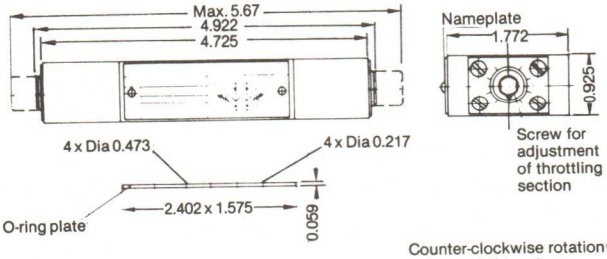
Pressure drop Δ p related to flow Q at constant throttle position



Dimensional Data



Conversion from meter-in to meter-out control is effected by rotating the valves on the axis "X" — "X"



Counter-clockwise rotation reduces shifting time
Clockwise rotation increases shifting time

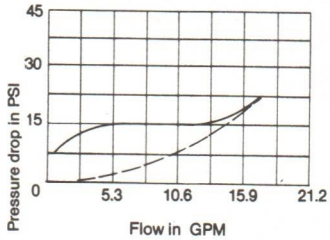
Performance Curves

Unit dimensions (dimensions in inches) Weight: approx. 4.4 LBS

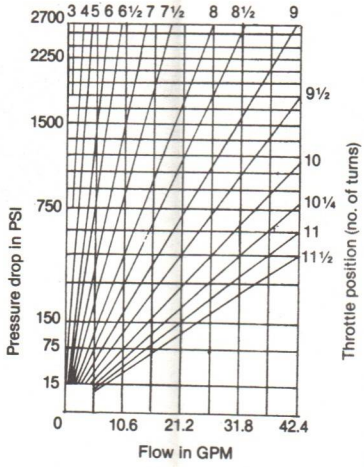
Z2FS10-1/2"

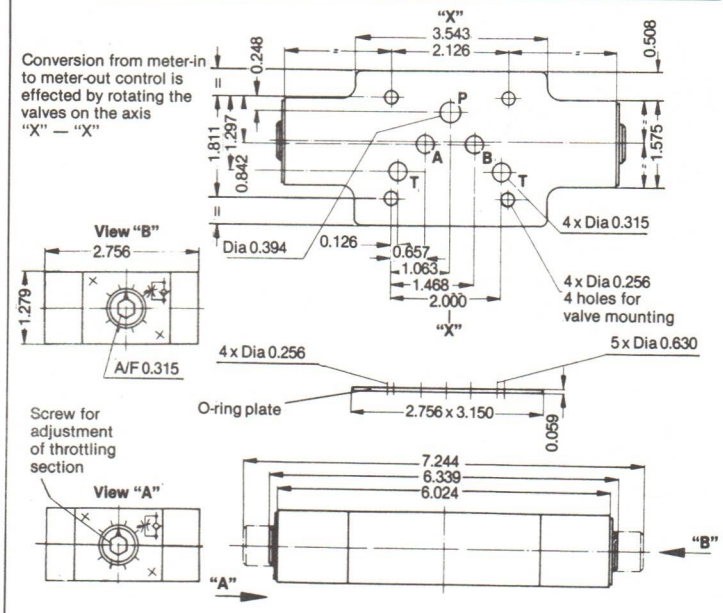
up to 5000 psi
D02 Mount
up to 42 GPM

Pressure drop Δ p related to flow Q — over check valve, throttle closed – over throttle, throttle open



Pressure drop Δ p related to flow Q at constant throttle position

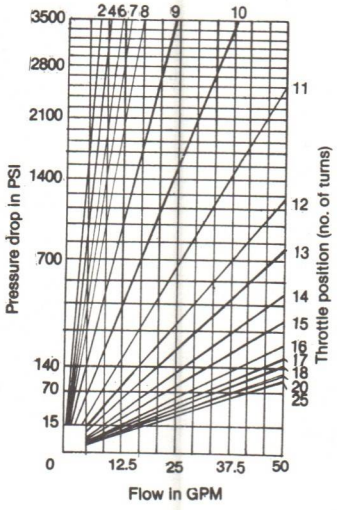




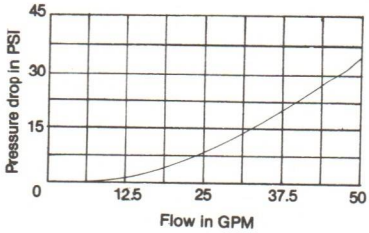
Z2FS16-3/4"

up to 5000 psi
D04 Mount
up to 50 GPM

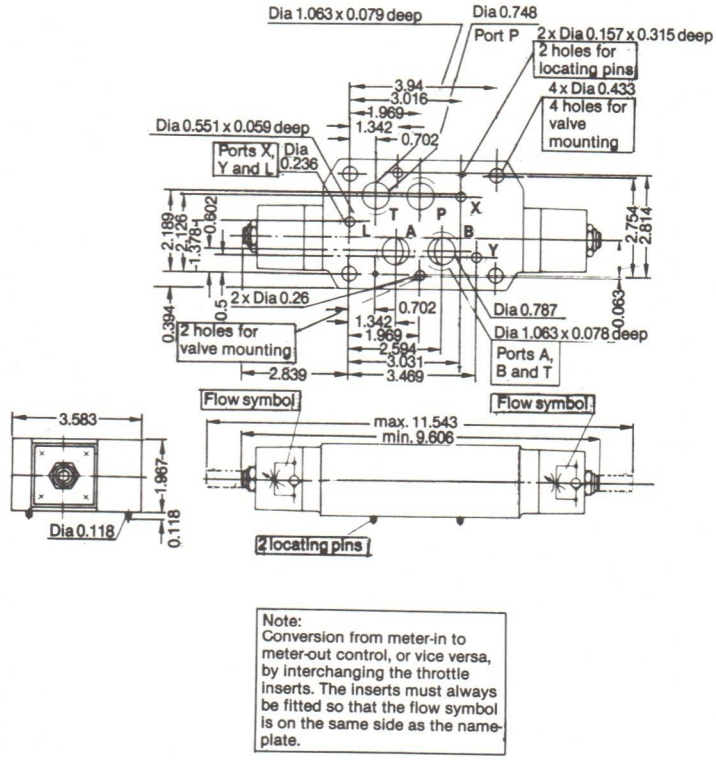
Pressure drop Δ p related to flow Q at constant throttle position



Pressure drop Δ p related to flow Q over check valve



Weight: approx. 10.3 lbs.

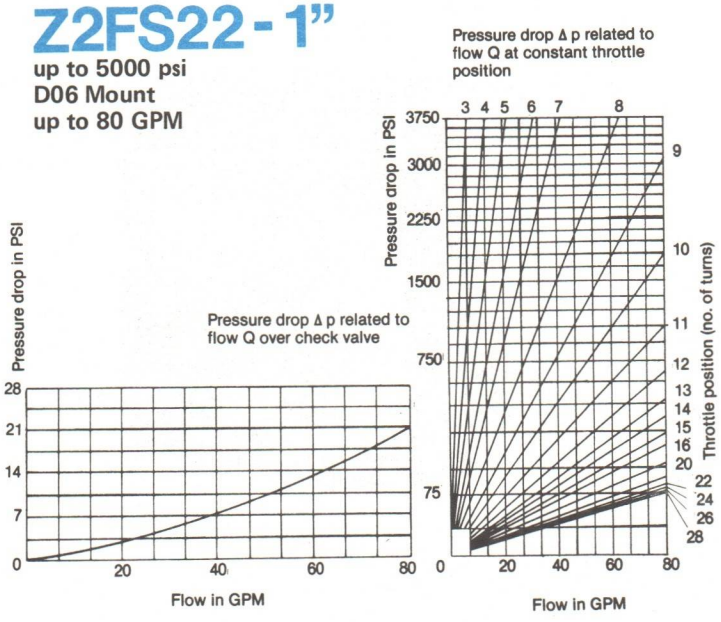


Note:
Conversion from meter-in to meter-out control, or vice versa, by interchanging the throttle inserts. The inserts must always be fitted so that the flow symbol is on the same side as the name-plate.

Performance Curves

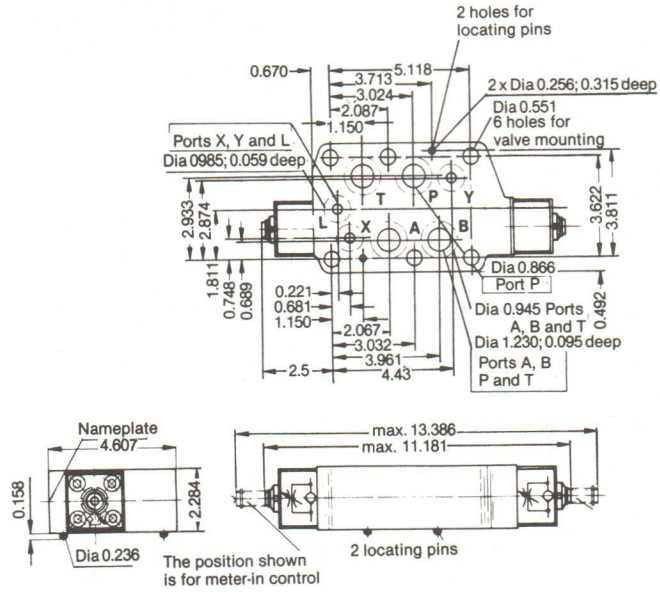
Z2FS22 - 1"

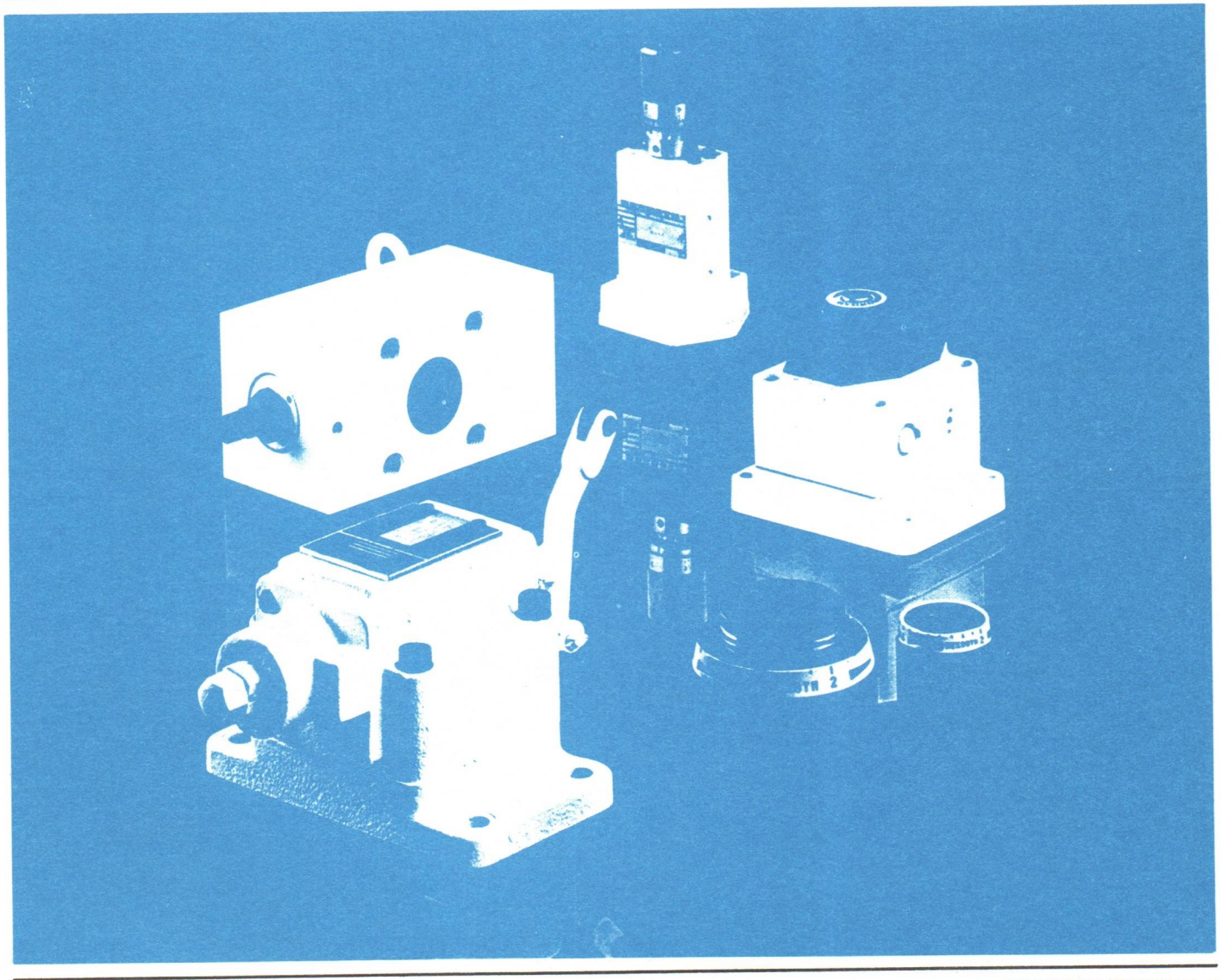
up to 5000 psi
D06 Mount
up to 80 GPM


Pressure drop Δ p related to flow Q at constant throttle position
Pressure drop in PSI
3750
3000
2250
1500
750
75
3 4 5 6 7 8
9 10 11 12 13 14 15 16 20 22 24 26 28
Throttle position (no. of turns)
0 20 40 60 80
Flow in GPM
Pressure drop Δ p related to flow Q over check valve
Pressure drop in PSI
28 21 14 7 0
20 40 60 80
Flow in GPM

Unit dimensions (Dimensions in inches)

Weight: approx. 17.6 LBS



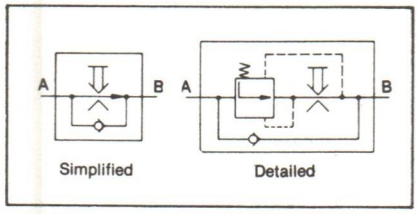


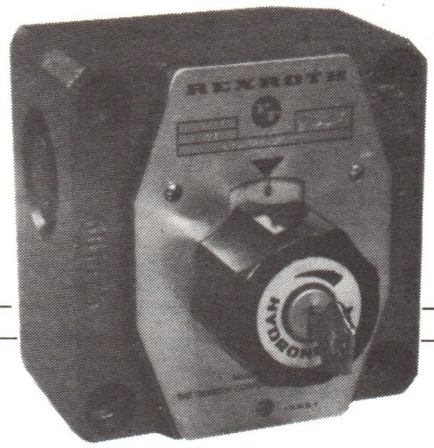
FlowControls

2-Way Flow Control Valve
up to 42.5 GPM, up to 5000psi

Flow control valves type FRM serve to throttle a flow in one direction independent of pressure and temperature variations, while allowing free return flow in the other. The orifice is operated mechanically by a lockable handknob. The angle of adjustment through the complete flow range is 300°, which corresponds to the 10 scale divisions marked on top of the valve.

The valves can be lifted with a stroke limiter for the pressure compensator. This ensures that in the zero position the pressure compensator takes up a positive control position and thus undesirable 'initial surge' is avoided.





Type FRM Size 5 - 1/8" to 16 - 3/4"

Ordering Code (Subplate and mounting screws to be ordered separately)

2FRM 10 – XX / 25L B V

SIZE
- 5 = 1/8"
- 10 = 1/2" (ANSI 2F02)
- 16 = 3/4" (ANSI 2F03)

MAXIMUM FLOW RATE

Size 5 (non-linear)			10 (linear)			16 (linear)		
0.2Q	= 0.05	GPM	5L	= 1.3	GPM	60L	= 15.5	GPM
0.6Q	= 0.16	GPM	10L	= 2.6	GPM	100L	= 26.5	GPM
1.2Q	= 0.32	GPM	16L	= 4.2	GPM	160L	= 42.5	GPM
3Q	= 0.8	GPM	25L	= 6.6	GPM			
6Q	= 1.6	GPM	50L	= 13.2	GPM			
10L	= 2.6	GPM (linear)						

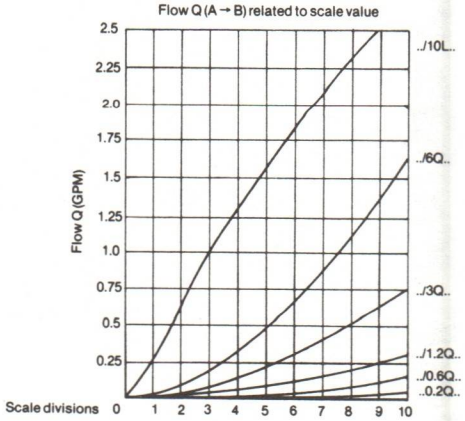
OPTIONS
- OMIT = If not required
- B = Stroke limiter

SEALS
- OMIT = Buna - N
- V = Viton

Refer to **RA 28138** and **RA 28383**

Performance Curves (measured at ϑ = 172 SSU and t = 122°F)

FRM 5 - 1/8"



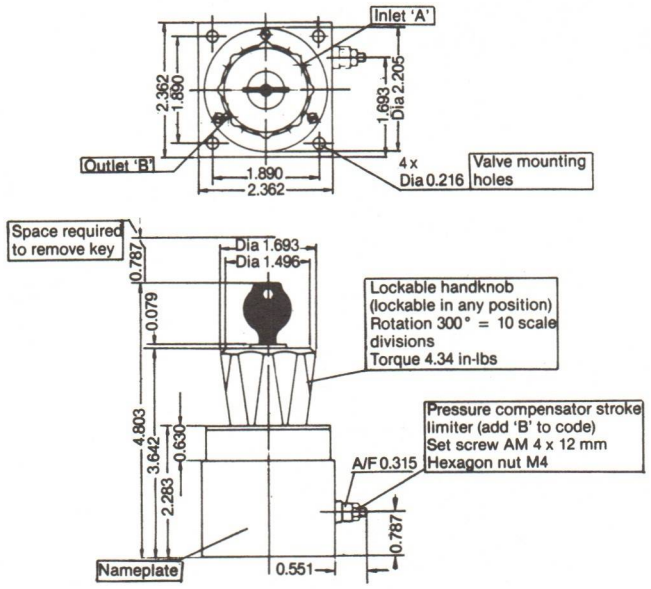
Technical Data

Hydraulic medium		Mineral oil					
Temperature range		– 4°F to + 160°F					
Viscosity range		35 to 1750 SSU					
Flow	GPM	0.05	0.16	0.32	0.8	1.6	2.6
Δp for free flow B→A (Q-dependent)	PSI	15	15	16.5	24	42	72

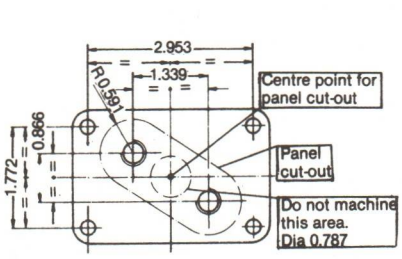
Flow control	pressure and viscosity compensated ± 2% ($Q_{Max.}$)
Max. operating pressure Inlet "A"	3000 PSI
Min. Pressure drop	45 PSI
Filtration	max 25 µm, when Q < 1.3 GPM max 10 µm, when Q < 0.13 GPM

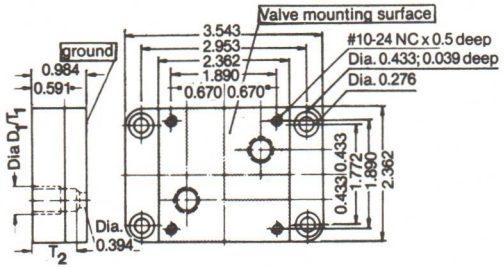
Unit Dimensions: valve (dimensions in inches) Weight: 3.5 LBS

Size 5



Unit Dimensions: Subplate (dimensions in inches)





Size	Type	Dia D_1	T_1	T_2	Weight	Valve mounting screws	Tightening torque
5 (1/8")	G 44/5 G 45/5	1/4" NPT 1/2" NPT	0.473 0.551	0.669 0.787	2.0 LBS	(4) S.H.C.S. #10-24 NC x 2"	5.6 ft-lb

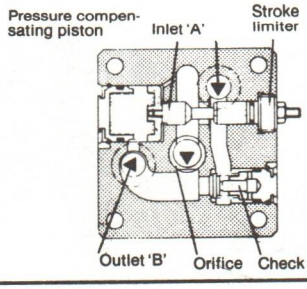
Size 10 - 1/2" & Size 16 - 3/4"

up to 5000 PSI up to 42.5 GPM

Technical Data

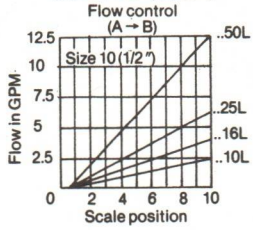
Flow control	pressure compensated, temperature stabilized + 2% (Q_{max})
Viscosity range	35 to 1750 SSU
Temperature range	– 4 to + 160 °F

Max. working pressure inlet "A"	Size 10 (1/2")	Size 16 (3/4")
	5000 PSI	
Min. pressure difference	40 to 100 PSI (Related to Q_{max})	70 to 170 PSI
Filtration	Max. 25 µm, when Q < 1.25 GPM Max. 10 µm, when Q <0.125 GPM	

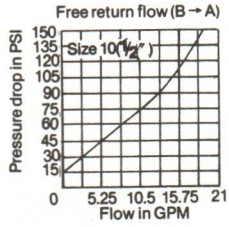


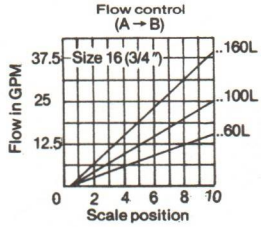
Performance Curves

SIZE 10 (1/2")

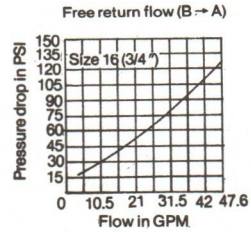


SIZE 10 (1/2")





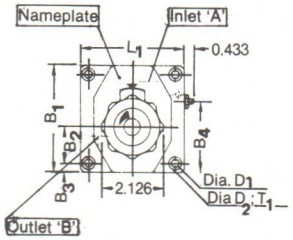
SIZE 16 (3/4")



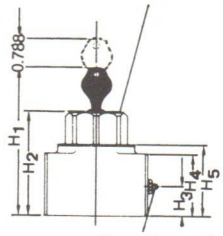
SIZE 16 (3/4")

Unit Dimensions (Dimensions in inches)

Size 10 - 1/2" & Size 16 - 3/4"



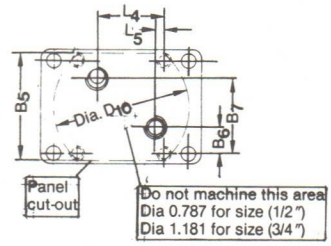
Lockable handknob adjustment
(can be fixed in any position)
adjustable through 300° = 10 scale divisions
torque 50 in-lb/1500 PSI

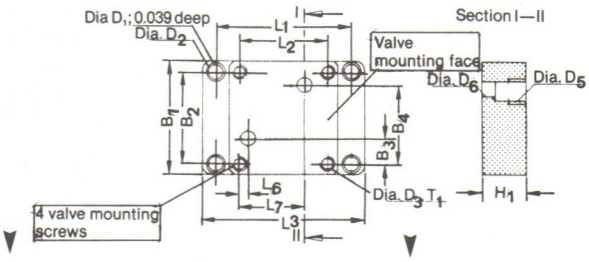


Pressure compensating piston stroke limiter
(add 'B' to code)
hollow set screw AM6 x 20 mm
hexagon nut M6

Valve	Size 10 (1/2")	Size 16 (3/4")
B_1	3.996	4.862
B_2	1.398	1.634
B_3	0.374	0.433
B_4	2.677	3.209
D_1	0.354	0.433
D_2	0.591	0.709
H_1	4.922	5.788
H_2	3.740	4.607
H_3	1.024	1.339
H_4	2.008	2.835
H_5	2.362	3.229
L_1	3.740	4.862
T_1	0.512	0.473
appr. Weight	12.3 LBS	24.9 LBS

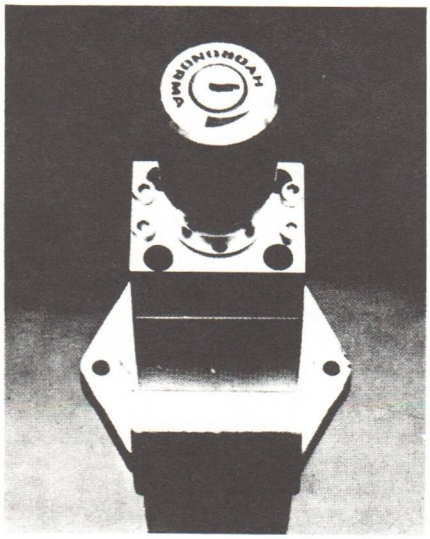
Subplate (dimensions in inches)

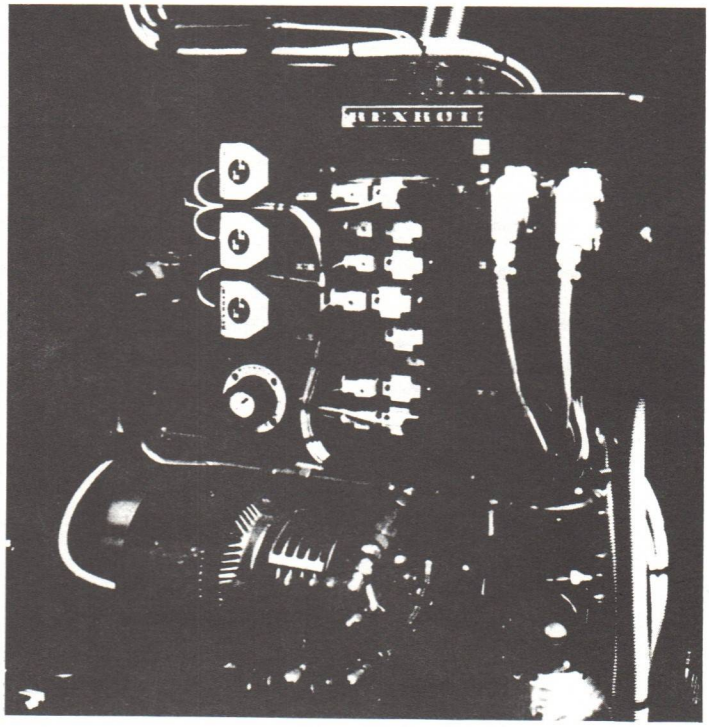




Subplate	Type	B1	B2	B3	B4	B5	B6	B7	D1	D2	D3(NC)	D5	D6	D10	H1
Size 10(1/2")	G 279/5(1/2") G 280/5(3/4")	3.996	3.248	1.185	2.819	3.661+0.197	1.185	2.658 2.5	0.590	0.354	5/16"–18	1/2"NPT 3/4"NPT	0.473	+0.197 4.527	1.181
Size 16(3/4")	G 281/5(1") G 282/5(1-1/2")	4.862	3.996	0.591	3.563	4.527+0.197	0.827 1.024	3.170 2.373	0.709	0.433	3/8"–16	1"NPT 1-1/2"NPT	0.788	+0.197 5.905	1.575

Subplate	Type	L1	L2	L3	L4	L5	L6	L7	T1	Appr. Weight	Valve Mounting Screws	Tight. Torque
Size 10(1/2")	G 279/5(1/2") G 280/5(3/4")	4.508	2.992	5.256	2.170	0.378	0.378	2.170	0.512	5.1 LBS	5/16"–18 NC x 2"	27 ft-lb
Size 16(3/4")	G 281/5(1") G 282/5(1-1/2")	5.748	3.996	6.614	2.953	0.807	2.953	0.788		8.8 LBS	3/8"–16 NC x 3"	48 ft-lb





REXROTH
WORLDWIDE HYDRAULICS

Additional FlowControls

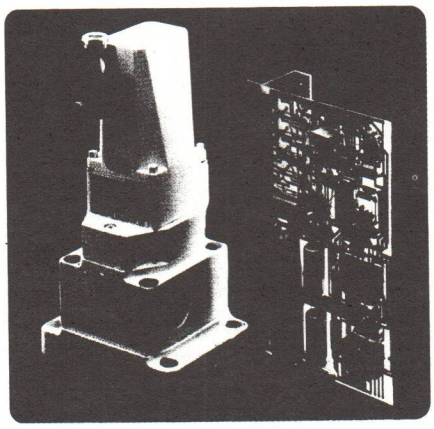
Rexroth FRH/FRW and FRE valves are basically model 2FRM flow controls with special operators for remote operation.

Flow control valve types FRH/FRW and FRE serve to throttle in one direction, independent of pressure and temperature, to provide free reverse flow. The throttling orifice of types FRH/FRW is operated hydraulically via rack and pinion; Type FRE via DC servo motor. FRW models utilize an electrically-actuated directional control valve to control throttling.

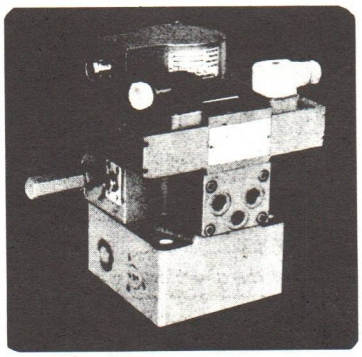
FRW/FRH valves can be supplied with a remote indicator to convert throttle setting angle to a proportional electric signal or a potentiometer for continuous monitoring of orifice position.

Control of orifice drive on type FRE valves is effected by means of an operational power amplifier control.

Refer to system schematics and further details below. For complete engineering data, request the specific RA data sheets designated for each model.



Type FRE



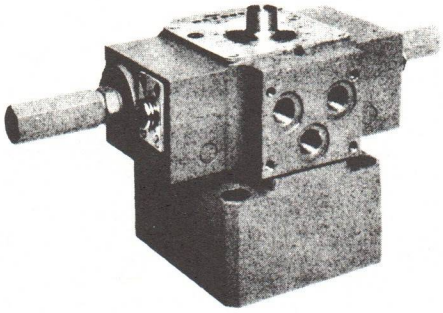
Type FRW

Size 10&16

Type FRH

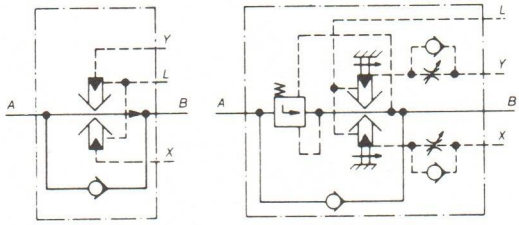
Size 10(1/2") ANSI ZF02
Size 16(3/4") ANSI ZF03

Refer to **RA 28385**



Throttle orifice hydraulically controlled via rack & pinion. Adjustment angle over complete flow range is 300°.

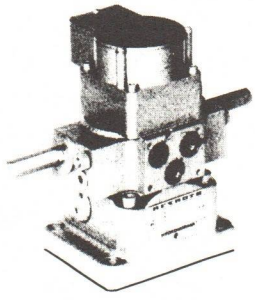
Max Pressure - 5000 psi
Flows up to 42.5 GPM
Subplate Mounted



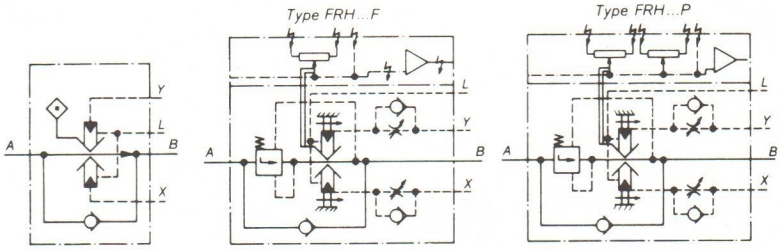
Simplified *Detailed*

Type FRH$^{F}_{P}$

Refer to **RA 28386**



Same basic operation as Type FRH, with the additional availability of remote indicator (to convert adjustment angle into a proportional electric signal) FRH...F or an indicator potentiometer FRH...P.



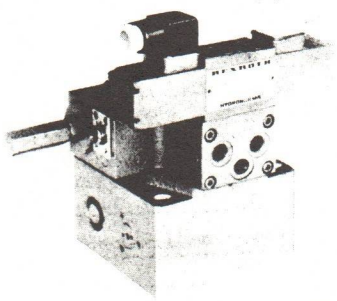
Simplified *Detailed*

Type FRW

Size 10(1/2") ANSI ZF02
Size 16(3/4") ANSI ZF03

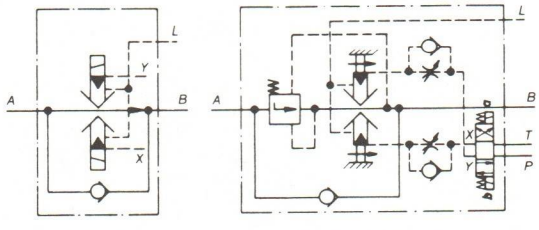
Refer to **RA 28387**

solenoid 'a' switched
flow controller Q_{max}



Hydraulic rack & pinion throttle orifice control, actuated by an electric directional control valve. 300° adjustment angle.

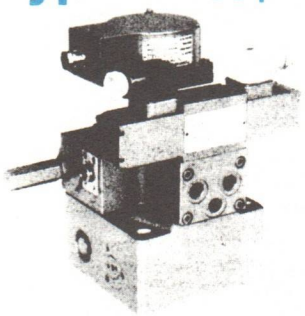
Max Pressure - 5000 psi
Flows up to 42.5 GPM
Subplate Mounted



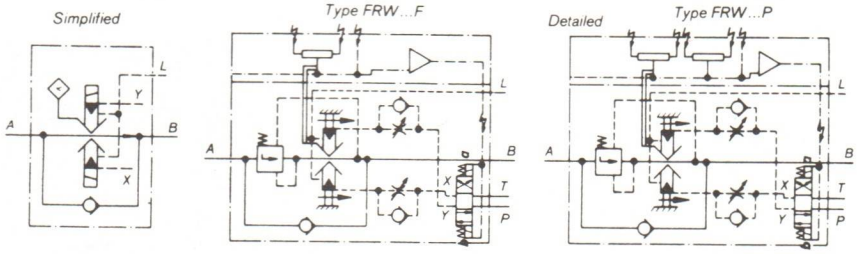
Simplified ***solenoid 'b' switched*** *Detailed*
flow controller Q_{min}

Type FRW$^{F}_{P}$

Refer to **RA 28388**



Same basic operation as Type FRW, with the availability of a remote indicator (FRW...F) or an indicator potentiometer (FRW...P).



solenoid 'a' switched flow controller Q_{max}

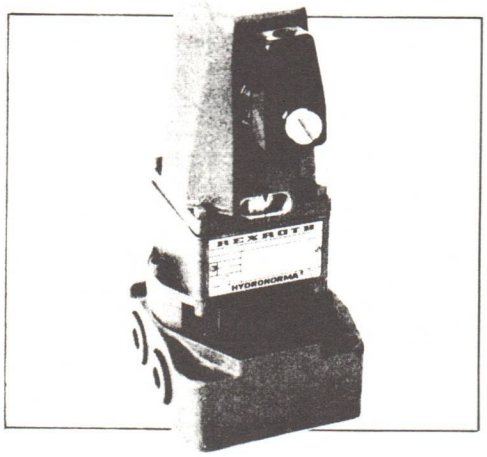
solenoid 'b' switched flow controller Q_{min}

Type FRE

Size 10(1/2") ANSI ZF02
Size 16(3/4") ANSI ZF03

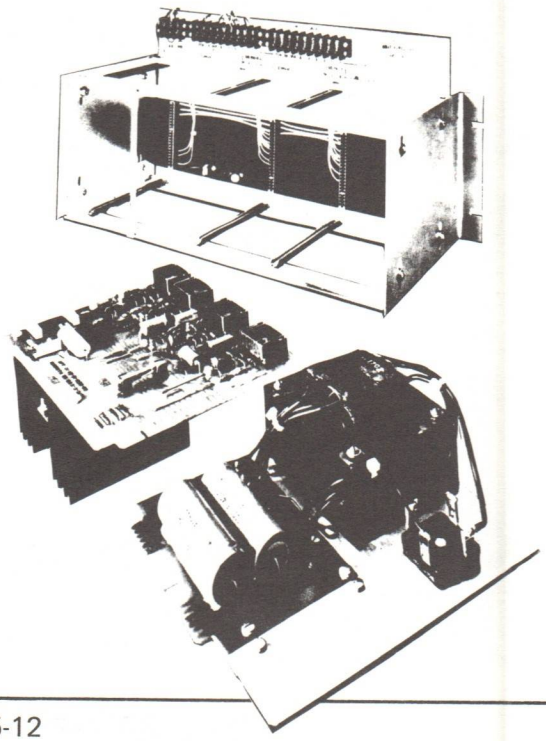
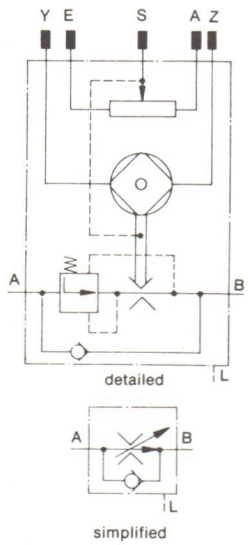
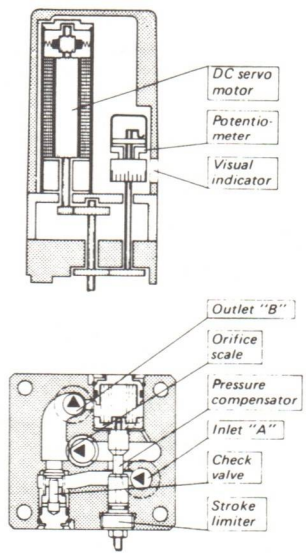
Max Pressure - 5000 psi
Flows up to 42.5 GPM
Subplate Mounted

Refer to **RA 28390**



Orifice adjustment is controlled by a DC servo motor. Hydraulic (orifice) and electrical sections of the valve are connected mechanically via a gearbox. A precision potentiometer provides a feedback of the orifice position. Control requires an operational power amplifier package.
Type FRE is suitable for use in closed loop and remote/programmable systems.

Description of Electronics
The operation-power amplifier type VE 186 is a DC amplifier which, through its wiring, allows a change of the transport action and/or amplifier.
The amplifier is universally suited for feeding from the DC servo motor and from the electric-hydraulic servo valves in automatic control system.
Special application cases are, for example, the control from electrically operated flow regulating valve and DC servo motor on the adjusting unit.
The amplifier consists of the following 3 stages, whereby the output signal is in phase opposition after every stage for the input stage.
An integrated operation amplifier as first stage. It permits addition, differentiation and integration of the input voltage.
One of the discrete construction elements is the built-in operation amplifier in the second stage. It is switched in a non-inverted state and serves for voltage and current amplification.
A current amplification results from the complimentary power transistors in the third stage.
The complete designation for the electroncis control package is VE 328-0-2-2/5. This includes the power supply, control amplifier, card rack, and command potentiometer.

Power Amplifier	Schematic	Section
		

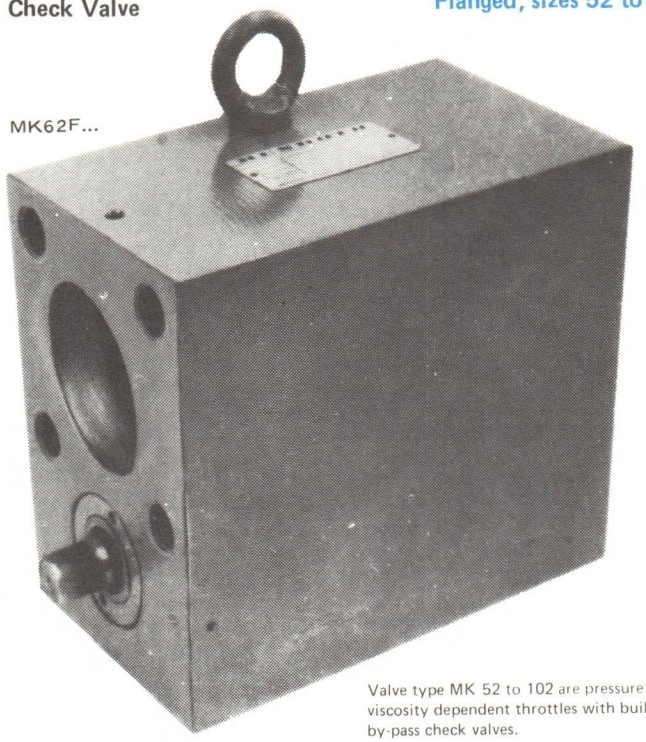
Additional FlowControls

TypeMK

Combined Throttle/ Check Valve

Max Pressure - 5000 psi(315 bar)
Flows up to 793 GPM
Mounting - Manifold, sizes 52 to 82
Flanged, sizes 52 to 102

MK62F...

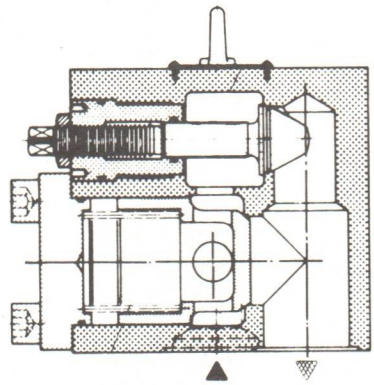


Valve type MK 52 to 102 are pressure and viscosity dependent throttles with built-in by-pass check valves.

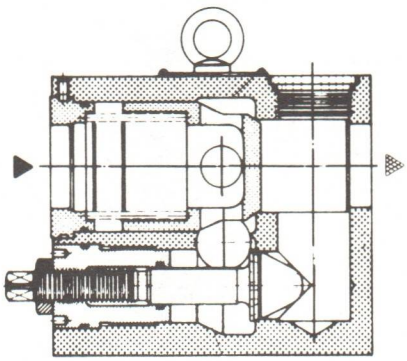
Size 52(2-1/2") to Size 102(4")

Refer to **RA 27570**

Model for manifold mounting



Model for flange connections

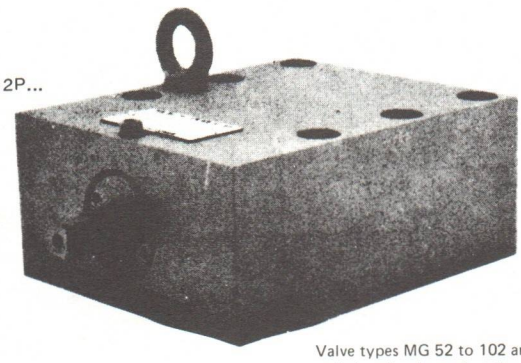


TypeMG

Throttle valve

Max Pressure - 5000 psi (315 bar)
Flows up to 793 GPM
Mounting - Manifold, sizes 52 to 82
Flanged, sizes 52 to 102

MG62P...

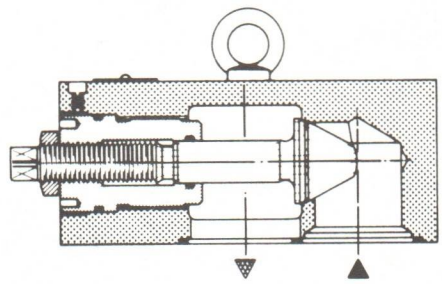


Valve types MG 52 to 102 are pressure and viscosity dependent throttle valves. The type MG valves can also be used as stop/check valves.

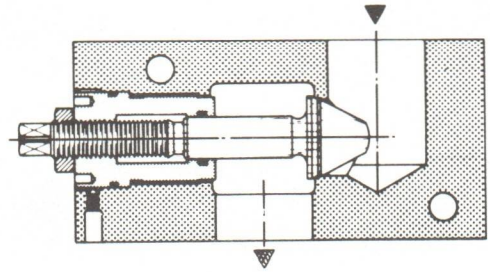
Size 52(2-1/2") to size 102(4")

Refer to **RA 27245**

Model for manifold mounting

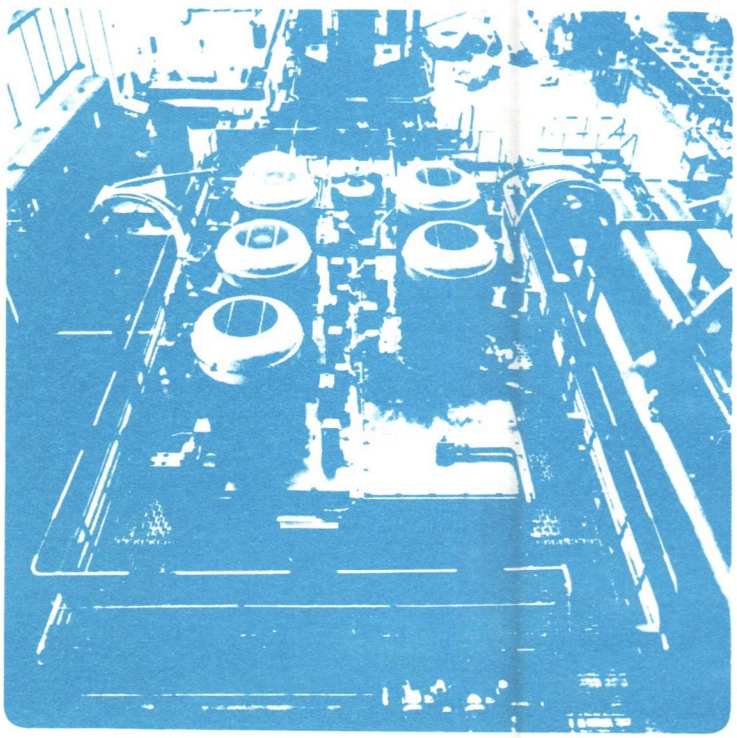


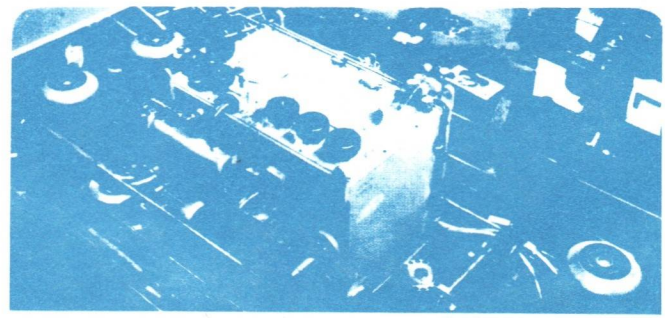
Model for flange connections

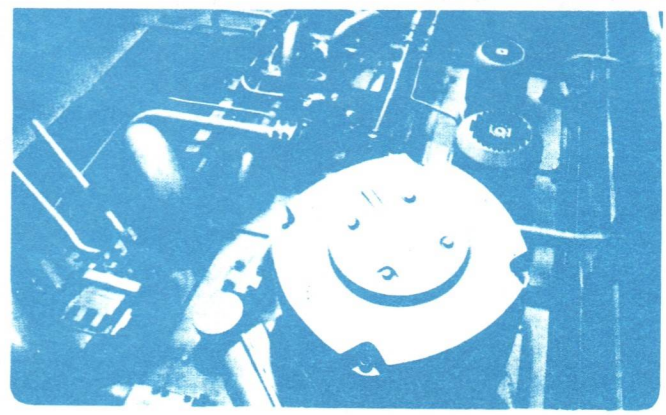


Summary | STANDARD POWER UNITS

TYPE	REXROTH CODE	DESIGN	SIZE/CAPABILITY	PAGE NO.
POWER UNIT	43 AKAG	Available in 3 Standard Configurations Up to 2 HP	2 1/2 Gallon	6-1
	43 AKAG	Available in 6 Standard Configurations Up to 5 HP	5 Gallon	6-3
PUMP, RADIAL PISTON TYPE R4	R4	3,5 and 10 Piston Designs	.9 to 5.29 GPM Up to 3000 PSI	6-5
PUMP, GEAR TYPE P1	P1	Available in 4 Standard Sizes	.05 in^3/rev to .20 in^3/rev .389 to 1.55 GPM Up to 4000 PSI	6-5
PUMP, GEAR TYPE S12S	S12S	Available in 8 Standard Sizes	.122 in^3/rev to .680 in^3/rev .950 to 5.29 GPM Up to 3000 PSI	6-5
RECTANGULAR Reservoirs	43 ATS	Available in 13 Standard Sizes	10 to 500 Gallons	6-6
PUMP MOTOR GROUPS	AMPG AVPG APS	Light Duty Vertical Mount Heavy Duty	for Vane, Gear, Radial Piston and Axial Piston Pump Package	6-7
VALVE STANDS	43 AVS	Light & Heavy Duty Applications	Standard & Custom Capabilities	6-9
RECTANGULAR RESERVOIRS	43 ATS	Pressureless	530 to 6600 Gallons	6-11
HYDRAULIC MANIFOLDS	AGA		Standard & Custom Capabilities	6-12

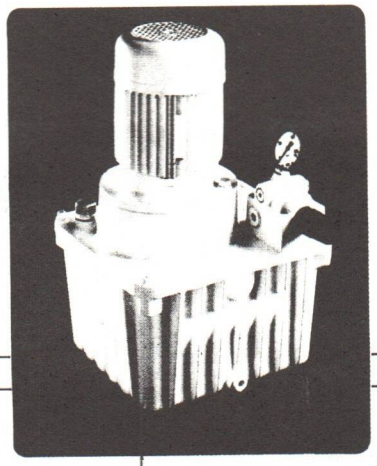






2½ Gallon PowerUnit

- Aluminum Reservoir
- Submerged Pump
- 3 Standard Options
- 3 Different Pumps
- Low Maintenance
- Tubed with 37° Flare Fittings



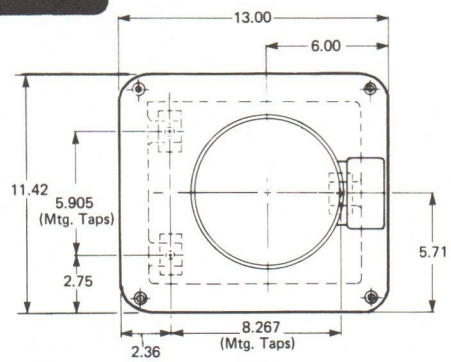
43 AKAG

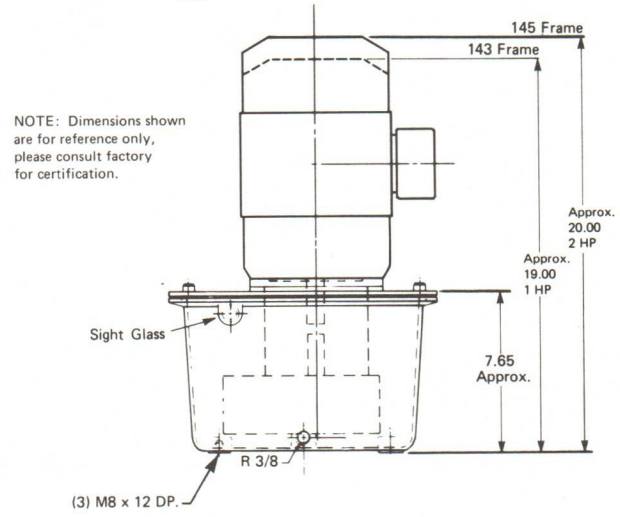
Ordering Code

43 AKAG **** 1 ODP 230/460/60Hz R4 *

- **MODEL NO.** (See Options A through C)
- **MOTOR HP**
  - 1 = 1 HP 143 TC
  - 2 = 2 HP 145 TC
- **ENCLOSURE**
  - ODP
  - TEFC
- **VOLTAGE AND CYCLE**
- **PUMP MODEL NO.** Use Component Model No.
- **ADDITIONAL INFORMATION**

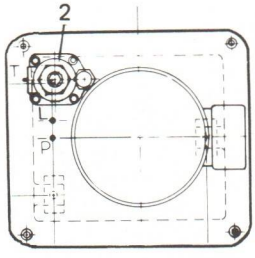
Basic unit dimensions

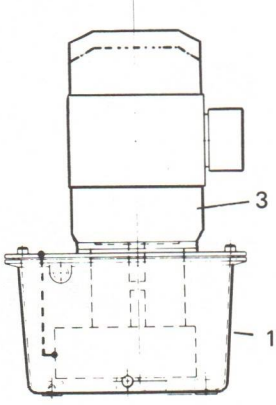


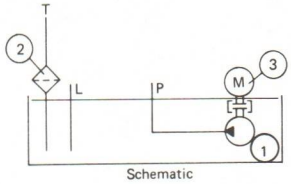


NOTE: Dimensions shown are for reference only, please consult factory for certification.

Option A







Schematic

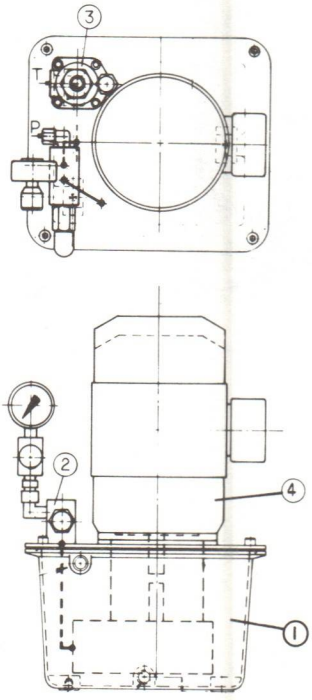
Schematic
T = 1/2" Tube
L, P = 3/8" Tube

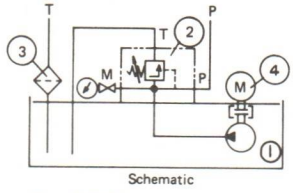
HP	Order No.	Pump Type
1	43 AKAG 3161/A	P1–*AS22R
2	43 AKAG 3162/A	S12S–*AK25R
	43 AKAG 3163/A	R4. . . .*

*Pump Size
R4,3 Pistons Only

Model Includes:
1 Reservoir 2.5 Gallon
2 Return Line Filter RF30
3 Motor Pump Group

Option B





Schematic

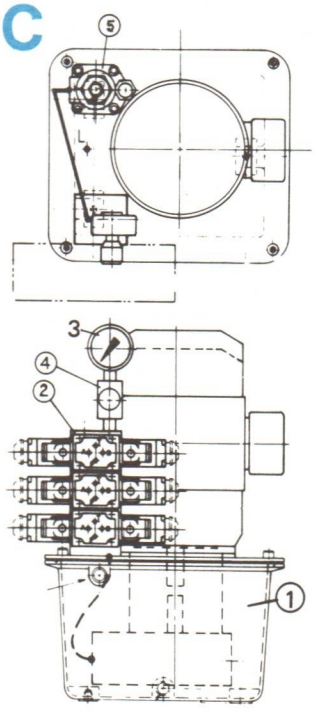
T = 1/2" Tube
P = 3/8" Tube
(AGA 0075)

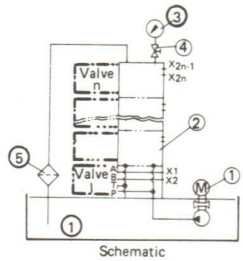
Model Includes:
1 Reservoir 2.5 Gallon
2 Pressure Control Block Size 6
3 Return Line Filter RF30
4 Motor Pump Group

HP	Order No.	Pump Type
1	43 AKAG 3161/B	P1–*AS22R
2	43 AKAG 3162/B	S12S–*AK25R
	43 AKAG 3163/B	R4. . . .*

*Pump Size
R4,3 Pistons Only

Option C





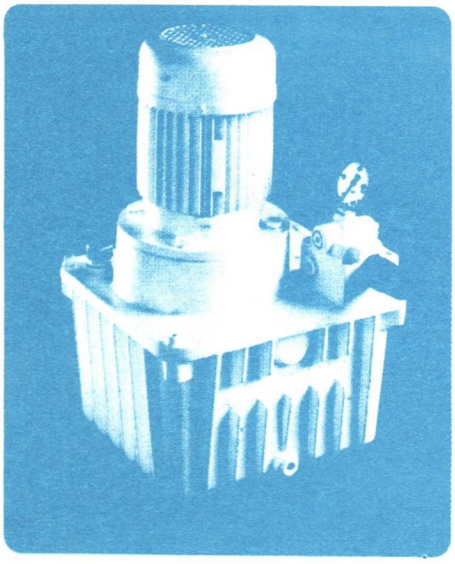
Schematic

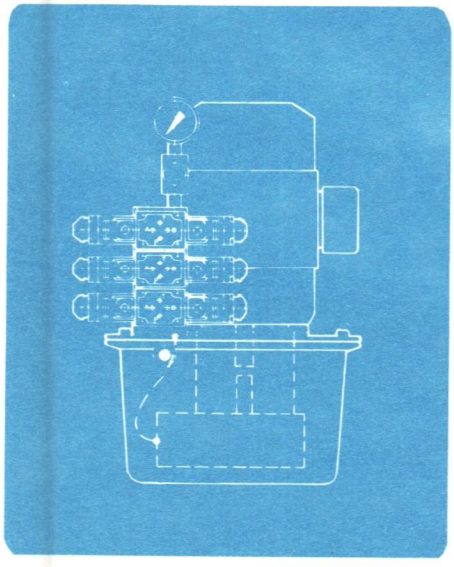
X1, X2 = 1/2" Tube

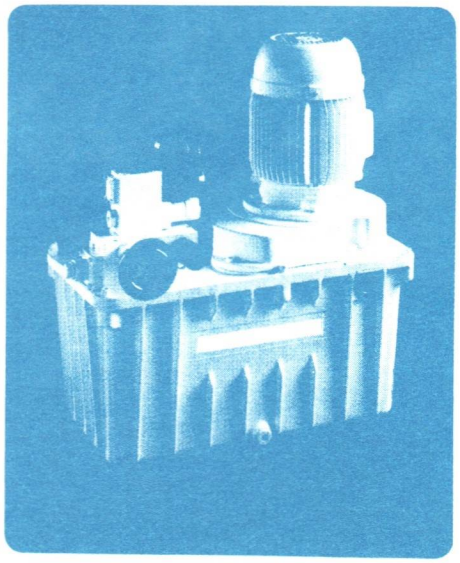
Model Includes:
1 Reservoir 2.5 Gallon
2 Bare Manifold D01/Size 6
3 Gage 2.5" Dia.
4 Gage Shut-Off Valve
5 Return Line Filter RF30

HP	Order No.	Pump Type
1	43 AKAG 3161/C	P1–*AS22R
2	43 AKAG 3162/C	S12S–*AK25R
	43 AKAG 3163/C	R4. . . .*

*only 3 Piston Pump

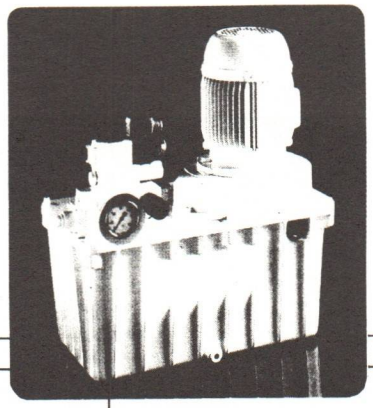






5 Gallon PowerUnit

- Aluminum Reservoir
- Submerged Pump
- 6 Standard Options
- 3 Different Pumps
- Low Maintenance
- Tubed with 37° Flare Fittings



43 AKAG

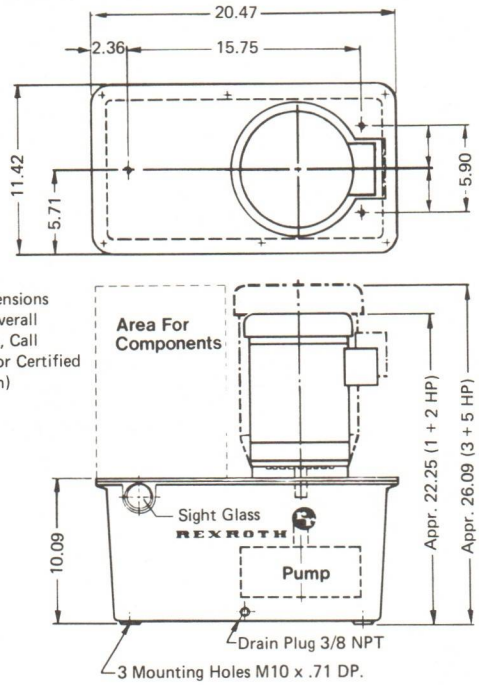
Ordering Code

43 AKAG ** 3 ODP 230/460/60Hz R4 ***

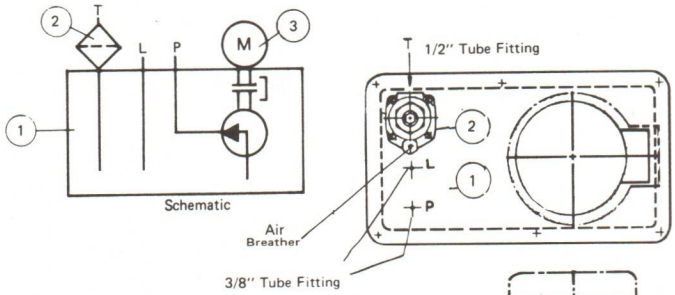
- **MODEL NO.** (See Options A through F)
- **MOTOR HP**
  - 1 = 1 HP 143 TC
  - 2 = 2 HP 145 TC
  - 3 = 3 HP 182 TC
  - 5 = 5 HP 184 TC
- **ENCLOSURE**
  - ODP
  - TEFC
- **VOLTAGE AND CYCLE**
- **PUMP MODEL NO.**
  - Use Component Model No.
- **ADDITIONAL INFORMATION**

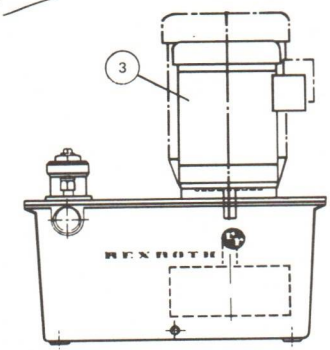
Basic unit dimensions

- remain the same for all options



Option A



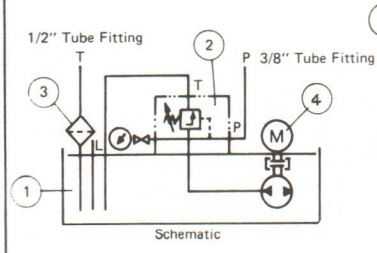


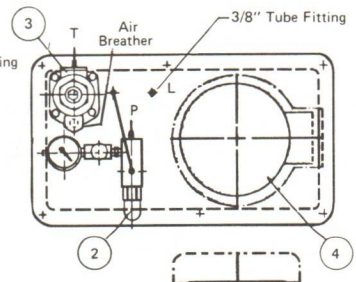
Model Includes
1 Reservoir 5 Gallon
2 Return Line Filter RF30. . .
3 Motor Pump Group

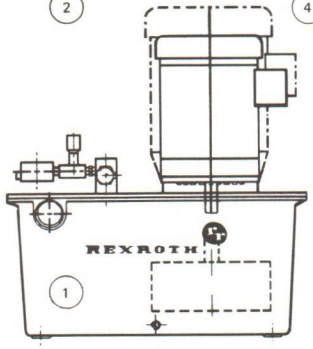
HP	Model No.	Pump Type
1 2	43 AKAG 3051/A	PI–*AS22R
	43 AKAG 3052/A	S12S–*AK25R
	43 AKAG 3053/A	R4. . . .*
3 5	43 AKAG 3054/A	PI–*AS22R
	43 AKAG 3055/A	S12S–*AK25R
	43 AKAG 3056/A	R4. . . .*

* Pump Size

Option B





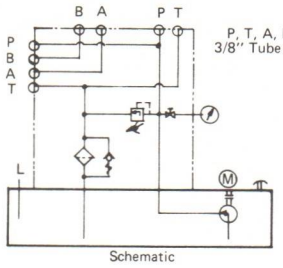


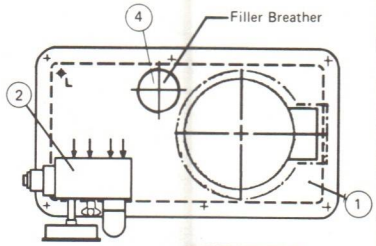
Model Includes:
1 Reservoir 5 Gallon
2 Pressure Control Block Size 6
3 Return Line Filter RF30. . . .
4 Motor Pump Group

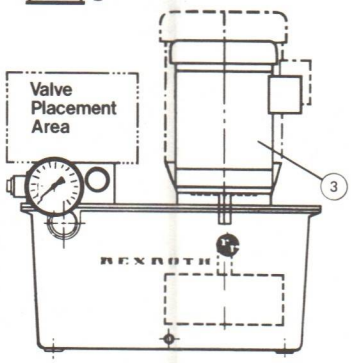
HP	Model No.	Pump Type
1 2	43 AKAG 3051/B	PI–*AS22R
	43 AKAG 3052/B	S12S–*AK25R
	43 AKAG 3053/B	R4. . . .*
3 5	43 AKAG 3054/B	PI–*AS22R
	43 AKAG 3055/B	S12S–*AK25R
	43 AKAG 3056/B	R4. . . .*

* Pump Size

OptionC





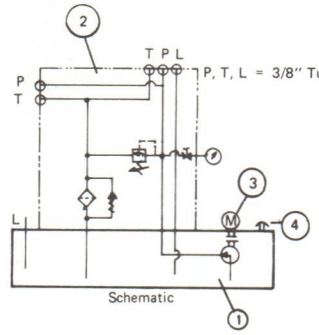


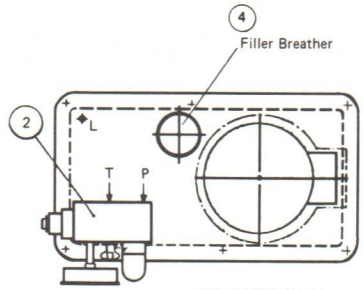
Model Includes
1 Reservoir 5 Gallon
2 Valve Connection Block with Return Line Filter PU-A42-23
3 Motor Pump Group
4 Filler Breather ELF 4-40-10

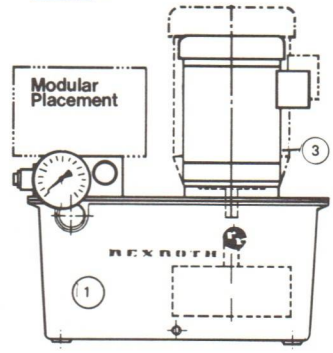
*Pump Size
R4,3 Pistons Only

HP	Model No.	Pump Type
1 2	43 AKAG 3051/C	PI–*AS22R
	43 AKAG 3052/C	S12S–*AK25R
	43 AKAG 3053/C	R4. . . *
3 5	43 AKAG 3054/C	PI–*AS33R
	43 AKAG 3055/C	S12S–*AK25R
	43 AKAG 3056/C	R4. . . *

OptionD





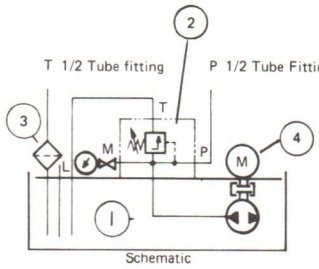


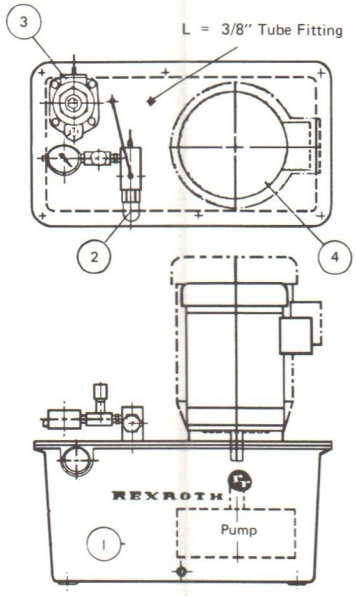
Model Includes:
1 Reservoir 5 Gallon
2 Modular Connection Block with Return Line Filter
3 Pump Motor Group
4 Filler Breather ELF 4-40-10

*Pump Size
R4,3 Pistons Only

HP	Model No.	Pump Type
1 2	43 AKAG 3051/D	PI–*AS22R
	43 AKAG 3052/D	S12S–*AK25R
	43 AKAG 3053/D	R4. . . *
3 5	43 AKAG 3054/D	PI–*AS22R
	43 AKAG 3055/D	S12S–*AK25R
	43 AKAG 3056/D	R4. . . *

OptionE



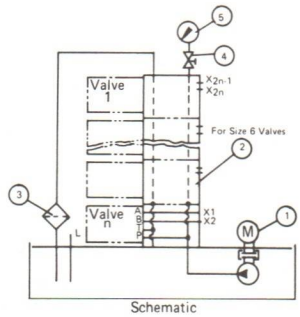


Model Includes
1 Reservoir 5 Gallon
2 Pressure Control Block Size 10
3 Return Line Filter RF30. . . .
4 Motor Pump Group

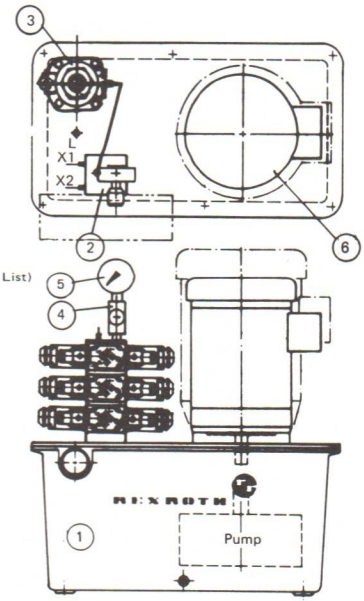
*Pump Size
R4,3 Pistons Only

HP	Order No.	Pump Type
1 2	43 AKAG 3051/E	PI–*AS22R
	43 AKAG 3052/E	S12S–*AK25R
	43 AKAG 3053/E	R4. . . *
3 5	43 AKAG 3054/E	PI–*AS22R
	43 AKAG 3055/E	S12S–*AK25R
	43 AKAG 3056/E	R4. . . *

OptionF



X1, X2 = 1/2" Tube
L = 3/8" Tube



Model Includes:
1 5 Gallon Reservoir
2 In-line Bar Manifold (As Specified on Component List)
3 Return Line Filter (PU-A 42-15)
4 Gauge Isolator Valve (PU-A 21-16)
5 Gauge 2-1/2" Dial
6 Pump Motor Group

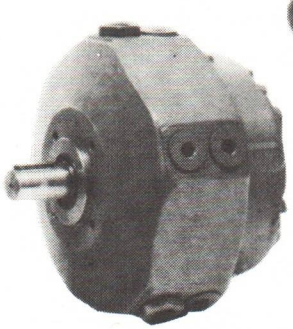
*Pump Size
R4,3 Pistons Only

HP	Order No.	Pump Type
1 2	43 AKAG 3051/F	P1–*AS22R
	43 AKAG 3052/F	S12S–*AK25R
	43 AKAG 3053/F	R4...*
3 5	43 AKAG 3054/F	P1–*AS22R
	43 AKAG 3055/F	S12S–*AK25R
	43 AKAG 3056/F	R4...*

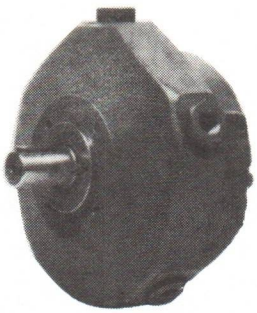
Pump Selection Guide

R4 Series Radial Piston Pumps

3 Piston



5 Piston



10 Piston

NOTE:
For additional pump information, please contact: The Rexroth Corporation
Industrial Hydraulics Division, 2315 City Line Road, Bethlehem, Pa. 18018
Telephone (215) 694-8300 Telex 84 7498

MODEL	NUMBER OF PISTONS	PISTON DIA.	IN^3/REV	GPM @ 1800 100 PSI *	MAX PSI **
R4-1.60-700	3	.393	.092	.70	10,150
R4-2.00-700	3	.393	.131	1.00	10,150
R4-2.50-700	3	.393	.158	1.20	10,150
R4-3.15-500	3	.590	.207	1.57	7,250
R4-5.00-500	3	.590	.294	2.23	7,250
R4-6.30-500	3	.590	.356	2.70	7,250
R4-3.15-700	5	.393	.218	1.65	10,150
R4-4.00-700	5	.393	.264	2.00	10,150
R4-8.00-500	5	.590	.490	3.71	7,250
R4-10.00-500	5	.590	.593	4.49	7,250
R4-5.00-700	10	.393	.306	2.32	10,150
R4-6.30-700	10	.393	.436	3.30	10,150
R4-8.00-700	10	.393	.527	3.99	10,150
R4-16.00-500	10	.590	.981	7.43	7,250
R4-20.00-500	10	.590	1.186	8.98	7,250

*Nominal Flow (GPM) is theoretical **Maximum Pressure (PSI) is dependent on HP

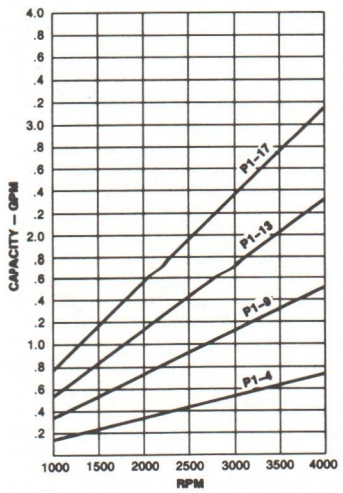
NOTE: For additional pumps, see pump section of this catalog

P1 Series Gear Pumps

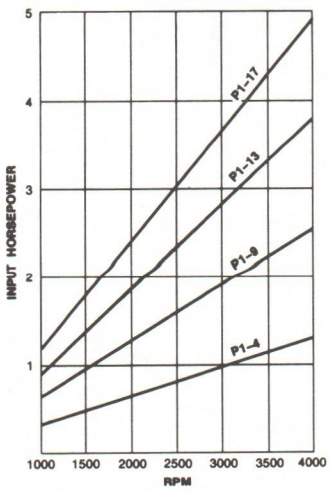
MODEL	IN^3/REV	GPM @ 1800 RPM 100 PSI *	MAX PSI **
P1–4	.05	.389	4,000
P1–9	.10	.779 (.778)	4,000
P1–13	.15	1.68 (1.67)	4,000
P1–17	.20	1.55	4,000

*Nominal Flow (GPM) is theoretical **Maximum Pressure (PSI) is dependent on HP

OUTPUT FLOW



HORSEPOWER INPUT

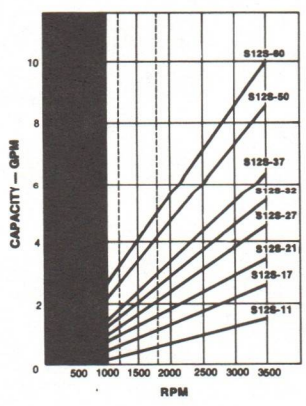


S12S Series Gear Pumps

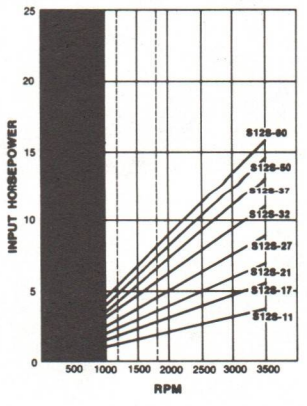
MODEL	IN^3/REV	GPM @ 1800 RPM 100 PSI *	MAX PSI **
S12S-11	.122	.950	3,000
S12S-17	.188	1.46	3,000
S12S-21	.244	1.90	3,000
S12S-27	.305	2.37	3,000
S12S-32	.366	2.85	3,000
S12S-37	.430	3.35	3,000
S12S-50	.580	4.51	2,500
S12S-60	.680	5.29	2,250

*Nominal Flow (GPM) is theoretical **Maximum Pressure (PSI) is dependent on HP

OUTPUT FLOW



HORSEPOWER INPUT



Rectangular Reservoirs
Size 10 to 500 Gallons

Features
- Tank with Feet
- Cleaning Cover
- Drain Plugs
- Oil Level Indicator
- Filler Breather
- Built-in Drip Pan (Res. top reset)

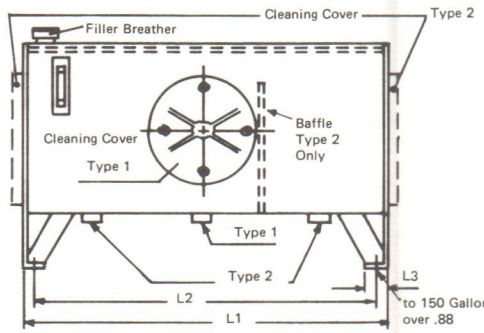
Available in 2 Types

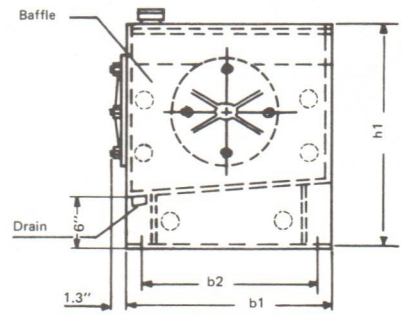
Type 1 = PU-A 40 - 01.01
One cleaning cover - without baffle

Type 2 = PU-A 40 - 01.02
Two cleaning covers - with baffle

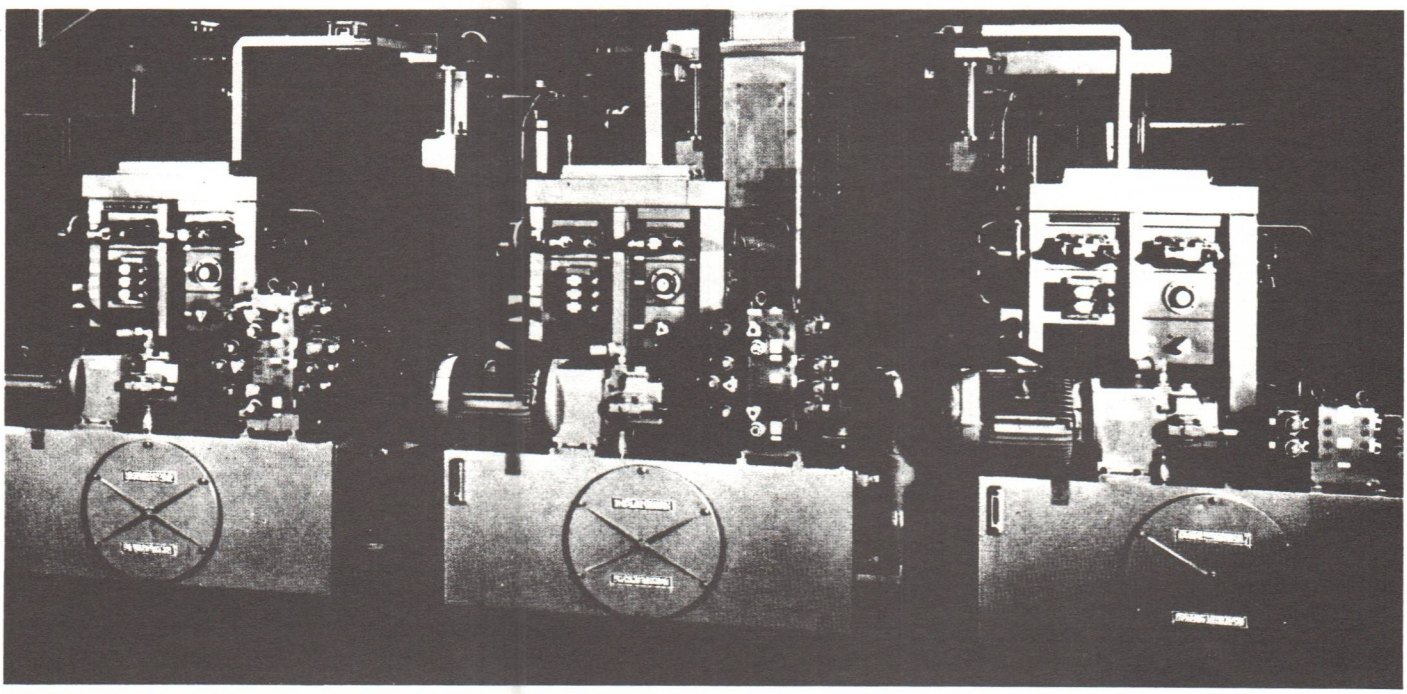
60 Type 1 840 004

- Size (Gallon)
- Style (1 or 2)
- Assembly No.
- Order No. (see below)





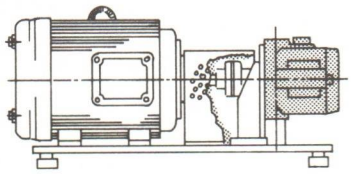
Gallon	Liter	Order No. Type 1	Order No. Type 2	b_1	b_2	L_1	L_2	L_3	h_1
10	38	840 029		13.00	11.00	20.00	17.50	2.00	18.00
20	76	840 001	840 013	18.00	15.50	24.33	21.75	2.00	21.00
30	114	840 002	840 014	20.75	18.25	30.33	27.00	2.50	21.44
40	151	840 003	840 015	20.75	18.25	36.36	33.00	2.50	22.75
60	227	840 004	840 016	24.00	21.50	42.38	39.00	2.50	24.25
80	303	840 005	840 017	30.00	27.50	42.38	39.00	2.50	25.38
100	379	840 006	840 018	30.00	27.50	42.38	39.00	2.50	29.25
120	454	840 007	840 019	30.00	27.50	48.50	45.00	2.75	30.25
150	568	840 008	840 020	30.00	27.50	60.50	57.00	2.75	30.25
200	757	840 009	840 021	36.00	33.50	72.62	69.00	2.75	29.81
300	1136	840 010	840 022	36.00	33.50	72.62	69.00	3.00	38.69
400	1514	840 011	840 023	36.00	33.50	84.75	80.75	3.00	43.19
500	1892	840 012	840 024	42.00	39.50	84.75	80.75	3.00	44.75



Pump Motor Groups / AMPG & AVPG

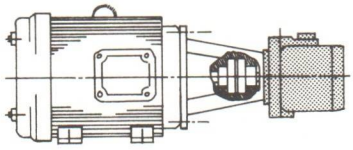
For Vane, Gear, Radial Piston and Axial Piston Pumps

Type A AMPG



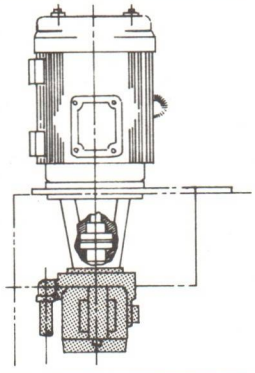
Consists of:
- Frame
- Pump Bracket
- Pump
- Motor
- Coupling
- Coupling Guard
- Sound Insulation

Type B AMPG



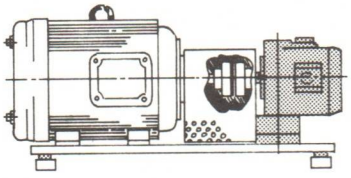
Consists of:
- Motor
- Bell Adaptor
- Pump
- Coupling
- Sound Insulation

Type C AVPG



Consists of:
- Motor
- Adaptor Plate with Gasket
- Bell Adaptor
- Pump
- Pressure Line (Piped/Tubed) to Adaptor Plate

Type D AMPG



Consists of:
- Frame
- Pump Subplate
- Pump
- Motor
- Coupling
- Coupling Guard
- Sound Insulation

Ordering Code

43 AMPG – B / 30 HP 1800 RPM / PUMP V3/25

CODE (COUNTRY)
43 = USA

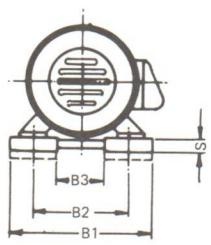
MODEL NO.
AMPG = H. pump motor group
AVPG = V. pump motor group

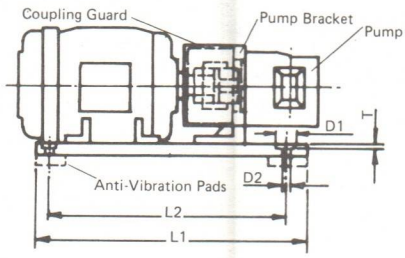
TYPE
A = With frame and bracket
B = With bell-adapter
C = With adapter plate and bell-adapter vertical
D = With subplate mounted pump and frame

MOTOR
(hp, rpm + voltage odp or tefc)
Indicate complete information

PUMP
(Complete ordering code according to Pump Data Sheet)

43 AMPG Light Duty Pump/Motor Groups



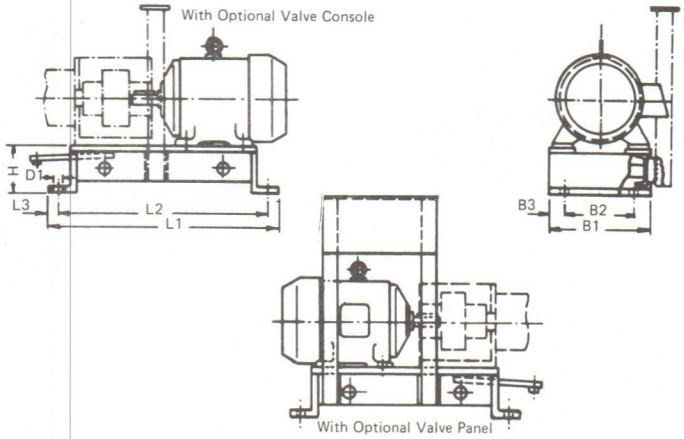


Frame Dimensions:

Size	Part No.	L1	L2	B1	B2	B3	D1	D2	T	S
143 145	810 128	14.50	13.00	8.50	6.00	3.50	.63	.437	.41	.75
182 184	810 129	20.00	18.00	11.00	7.50	5.00				
213 215	810 130	22.00	19.00		8.50	6.00	.81	.562	.53	1.00
254 256	810 131	27.00	24.00	13.00	10.00	7.00				
284 286	810 132	29.00	26.00	14.00	11.00		1.00	.688	.66	1.25
324 326	810 349	34.00	31.00	16.00	12.50	9.00				

Features:
- Welded Frame Construction
- Equipped with Anti-Vibration Pads (No Pressure Hose Required)
- or with Noise Dampening Elements (Double U-Shock Mounts) (Pressure Hose Required)

43 APS Heavy Duty Pump/Motor Groups

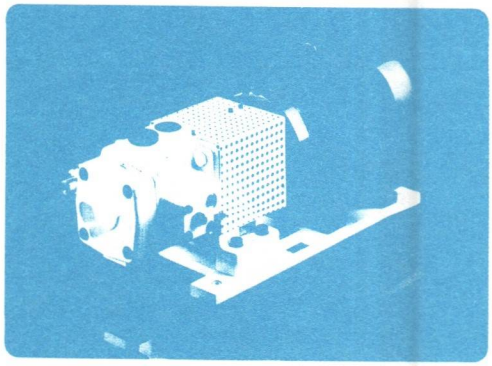


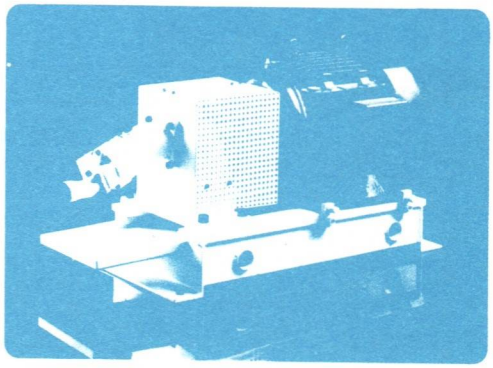
Frame Dimensions:

Size	Part No.	B1	B2	B3	L1	L2	L3	D1	H
213 215	810 120	11.00	8.50	1.25	25.75	23.75	1.00	.688	4.25
254 256	810 121	13.00	10.00	1.50	31.00	28.50	1.25	.75	4.25
284 286	810 122	14.50	11.50		36.25	33.50	1.38		5.75
324 326	810 123	16.50	12.50	2.00	43.25	39.50	1.88	1.00	6.75
364 365	810 124	18.50	13.50	2.50	44.75	41.00			7.00
404 405	810 125	20.50	15.50		48.50	45.00	1.75		8.00
444 445	810 126	23.00	18.00	2.50	54.00	51.00	1.50		8.75
447 449	810 127				63.00	60.00			10.25

Available Option: Softmount Package (Call For Information)

Features:
- Welded Construction
- Machined Mounting Surface For Pump and Motor

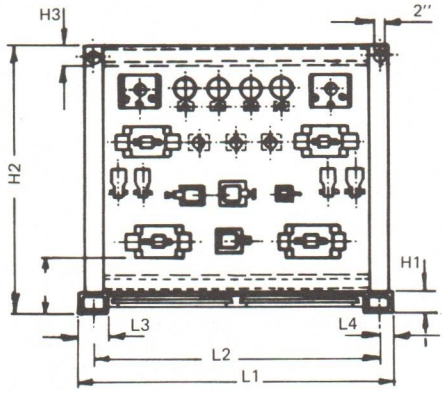


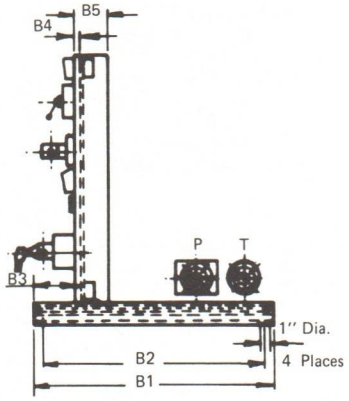


43 AVS ValveStands

Light and Heavy Duty

Dimensional Data

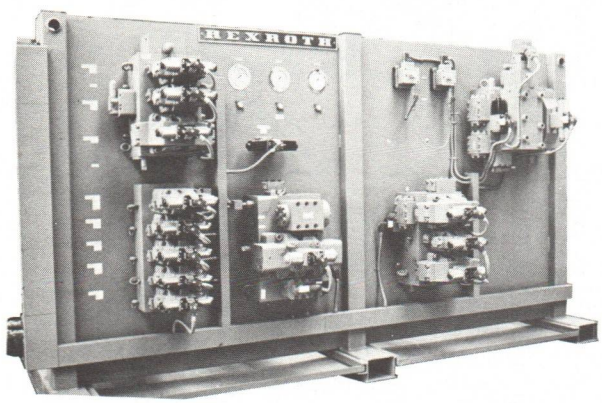




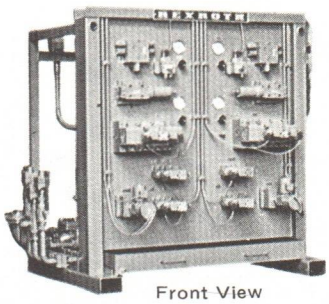
Light Duty:												
Model	**L1**	**L2**	**L3**	**L4**	**B1**	**B2**	**B3**	**B4**	**B5**	**H1**	**H2**	**H3**
L60	60	55										
L80	80	75	5	2.5	50	46	8	1.375	5	3	Customized	3
L100	100	95										
L120	120	115										
Heavy Duty:												
H60	60	54										
H80	80	74	6	3	60	56	12	2.375	8	4	Customized	5
H100	100	94										
H120	120	114										

L 60 PU–A02–30.03

- Light Duty = L
- Heavy Duty = H
- Size: 60, 80, 100, 120
- Rexroth Standard

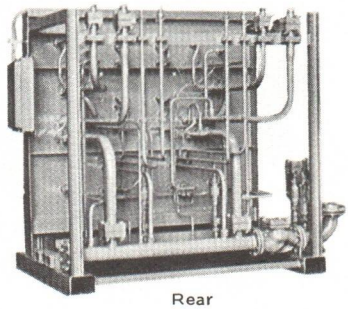


Valve Stand with Manifolds



Heavy Duty Valve Stand
Type AVS

Front View



Rear

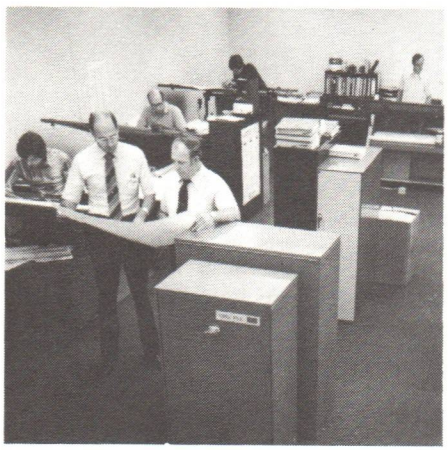
HydraulicSystems

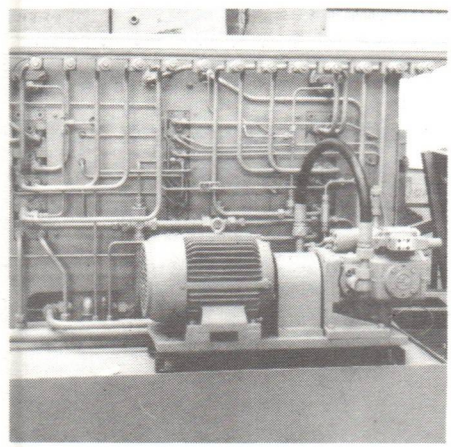
Industrial Hydraulics Division

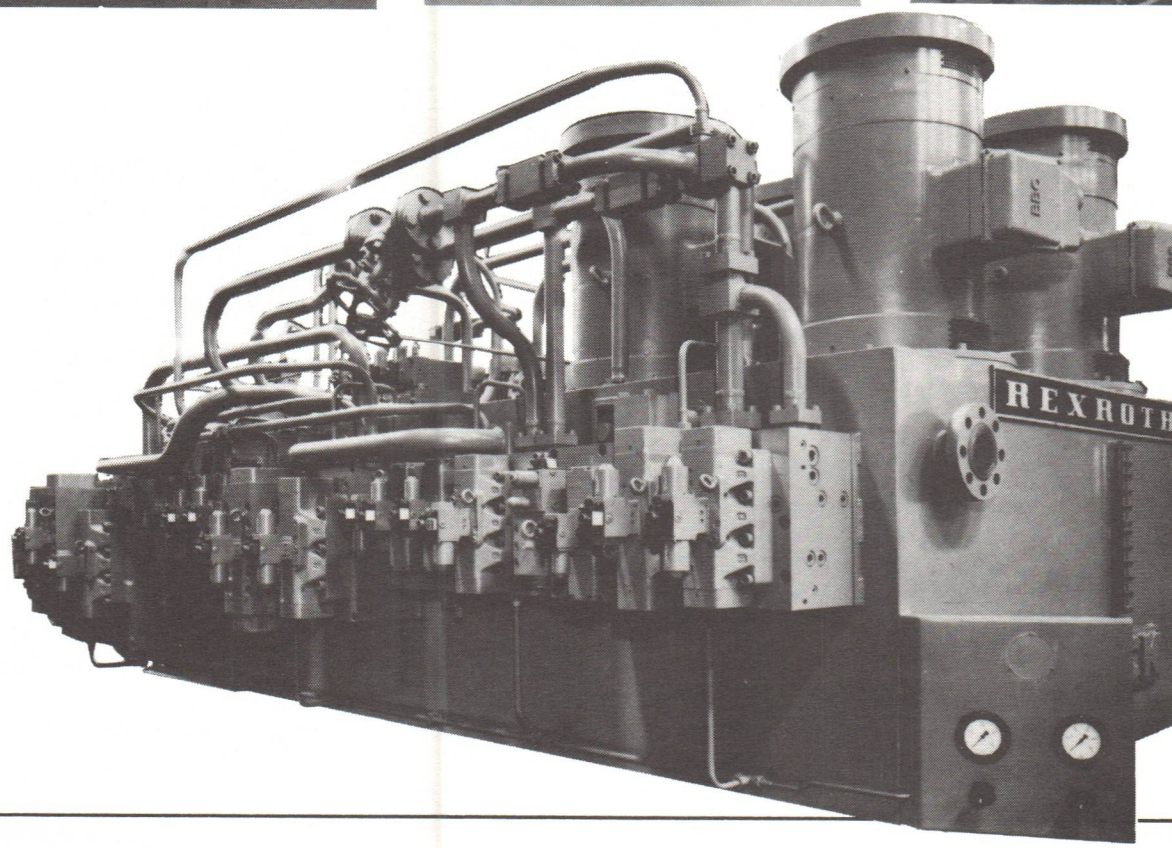
Rexroth's capability of engineering and manufacturing complete hydraulic systems stems from years of experience with various systems applications throughout the world. Our staff of engineers, combined with the availability of the world's largest, most extensive, and widely-proven line of hydraulic components, assures you the utmost in system reliability and total quality control. Custom design and engineering is the key to Rexroth's power unit production. Various standard units are also available.

You can't beat the system, you can't do better than...

Rexroth!







PRESSURELESS

Rectangular Reservoirs

530 to 6600 Gallons 2000 to 25,000 Liters

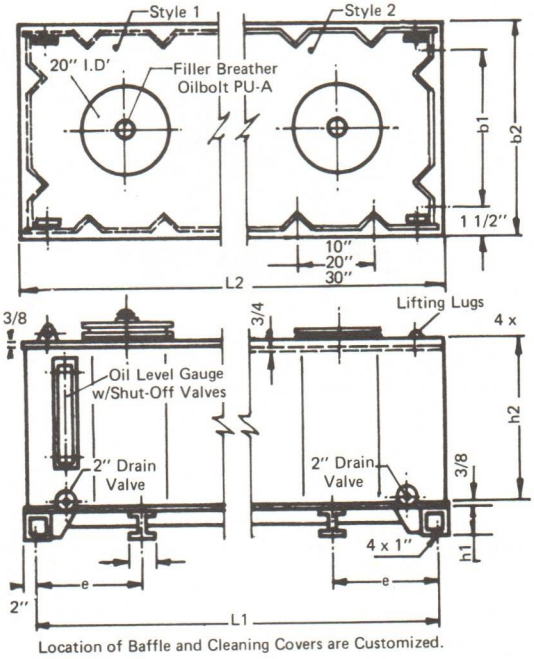
Style 1: With flat top plate for tanks without superstructure.

Style 2: With recessed top plate (built-in driptray) for on top mounted returnline filters, circulating pumps or other accessories.

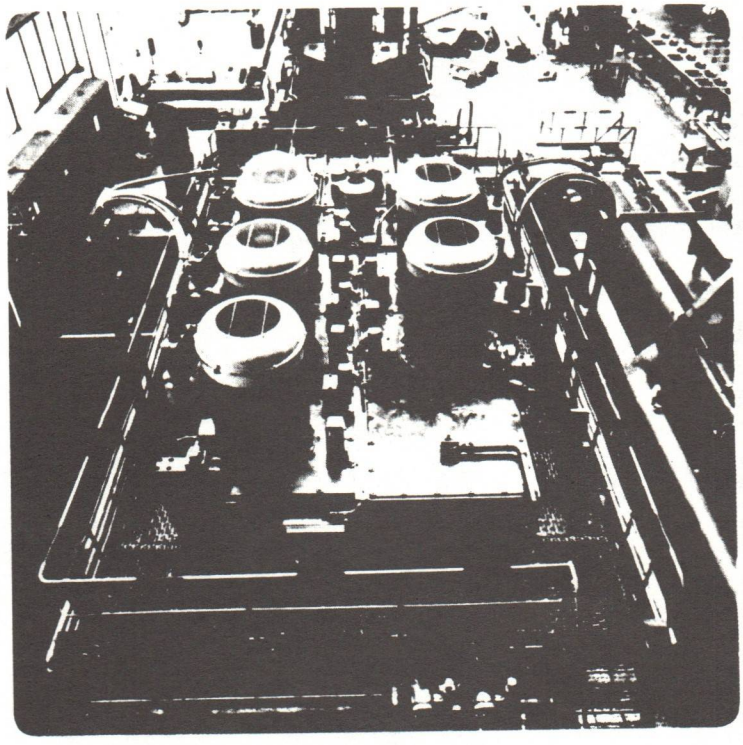
REXROTH
WORLDWIDE HYDRAULICS

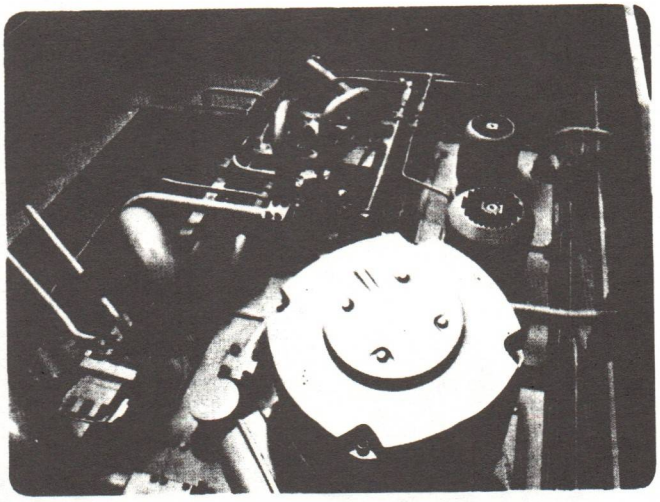
Oil Capacity Gallons (Liters)	Total Capacity Gallons (Liters)	b1	b2	e	h1	h2	L1	L2	S
530 (2000)	580 (2203)	39 (990)	42 (1066)	2x34 (2x645)	4 (100)	48 (1219)	68 (1728)	72 (1829)	3/16 (4.76)
790 (3000)	880 (3335)	39 (990)	42 (1066)	3x34.6 (3x878)	4 (100)	48 (1219)	104 (2642)	108 (2743)	3/16 (4.76)
1060 (4000)	440 (4316)	45 (1143)	48 (1219)	3x34.6 (3x878)	4 (100)	54 (1371)	104 (2642)	108 (2743)	3/16 (4.76)
1320 (5000)	1430 (5421)	51 (1295)	54 (1371)	3x34.6 (3x878)	4 (100)	60 (1524)	104 (2642)	108 (2743)	3/16 (4.76)
1585 (6000)	1780 (6739)	57 (1448)	60 (1524)	4x29 (4x736)	5 (125)	60 (1524)	116 (2946)	120 (3048)	3/16 (4.76)
1850 (7000)	2150 (8129)	69 (1752)	72 (1828)	4x29 (4x736)	5 (125)	60 (1524)	116 (2946)	120 (3048)	3/16 (4.76)
2115 (8000)	2400 (9069)	81 (2057)	84 (2133)	4x29 (4x736)	5 (125)	60 (1524)	116 (2946)	120 (3048)	3/16 (4.76)
2380 (9000)	2620 (9920)	81 (2057)	84 (2133)	4x30.2 (4x768)	5 (125)	60 (1524)	121 (3074)	125 (3175)	3/16 (4.76)
2640 (10,000)	2935 (11,110)	81 (2057)	84 (2133)	4x33.9 (4x863)	5 (125)	60 (1524)	136 (3454)	140 (3556)	3/16 (4.76)
3300 (12,500)	3710 (11,031)	81 (2057)	84 (2133)	6x28.6 (6x728)	5 (125)	60 (1524)	172 (4368)	176 (4470)	1/4 (6.3)
4230 (16,000)	4750 (17,983)	81 (2057)	84 (2133)	8x27.6 (8x701)	5 (125)	60 (1524)	221 (5614)	225 (5715)	1/4 (6.3)
5290 (20,000)	5955 (22,537)	81 (2057)	84 (2133)	8x28.8 (8x733)	5 (125)	72 (1828)	231 (5868)	235 (5969)	1/4 (6.3)
6600 (25,000)	7360 (27,857)	81 (2057)	84 (2133)	9x32.2 (9x818)	5 (125)	72 (1828)	286 (7264)	290 (7366)	1/4 (6.3)

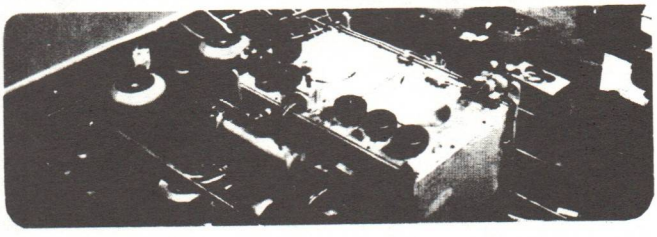
Metric Equivalents



Location of Baffle and Cleaning Covers are Customized.

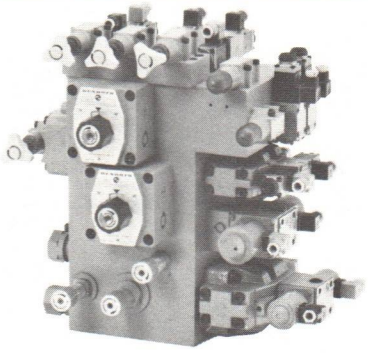




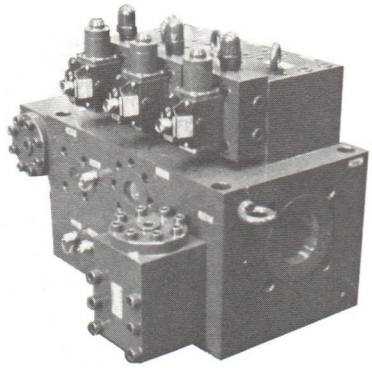


HydraulicManifolds

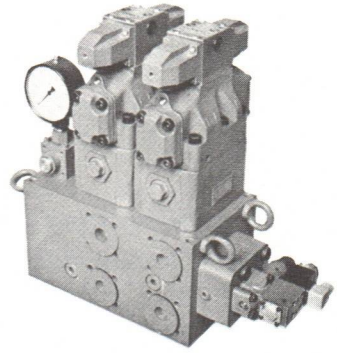
Standard and Custom Designs



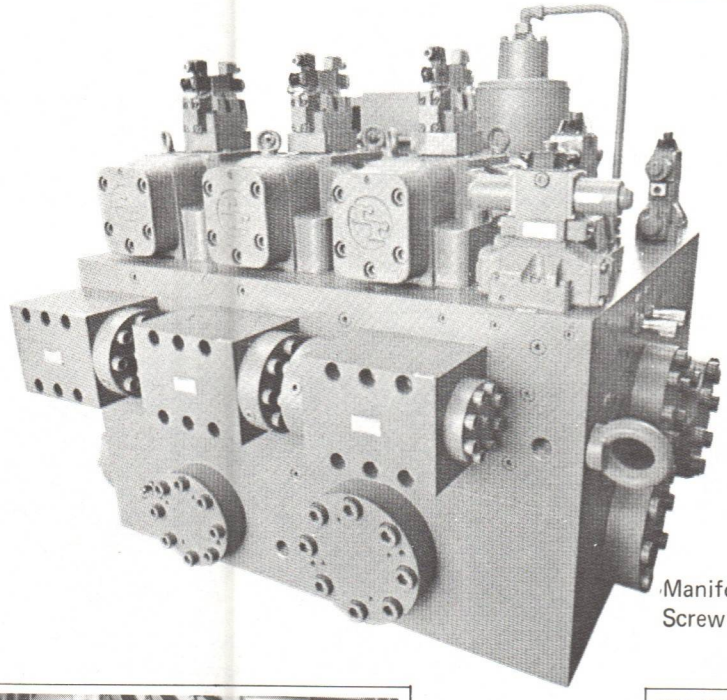
Manifold for plastics injection molding machine for control of all standard functions



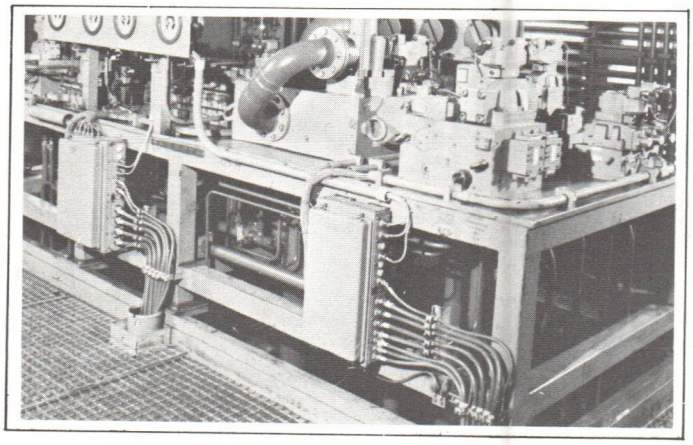
Manifold for Winch Braking System



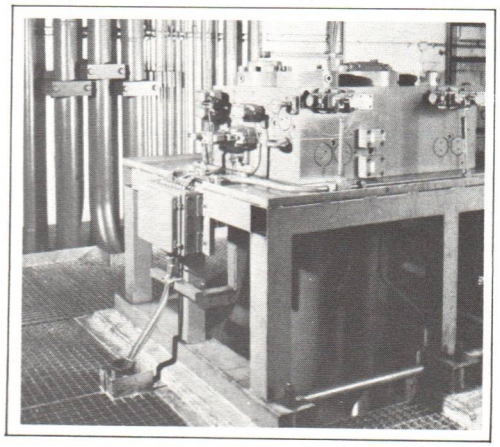
Manifold for a Belt Conveyor System



Manifold for a Screw Press Drive



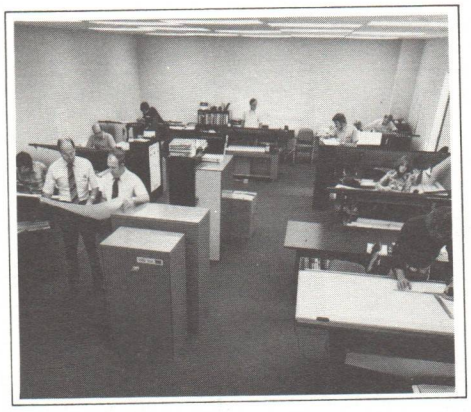
Manifolds Mounted on Valve Tables

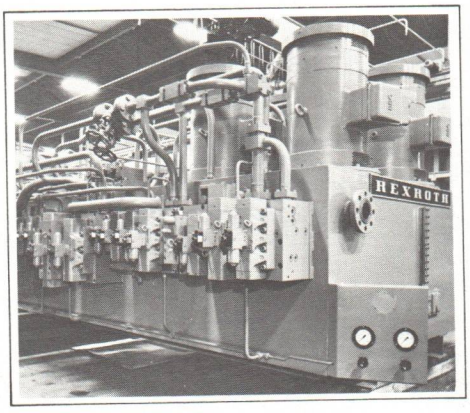


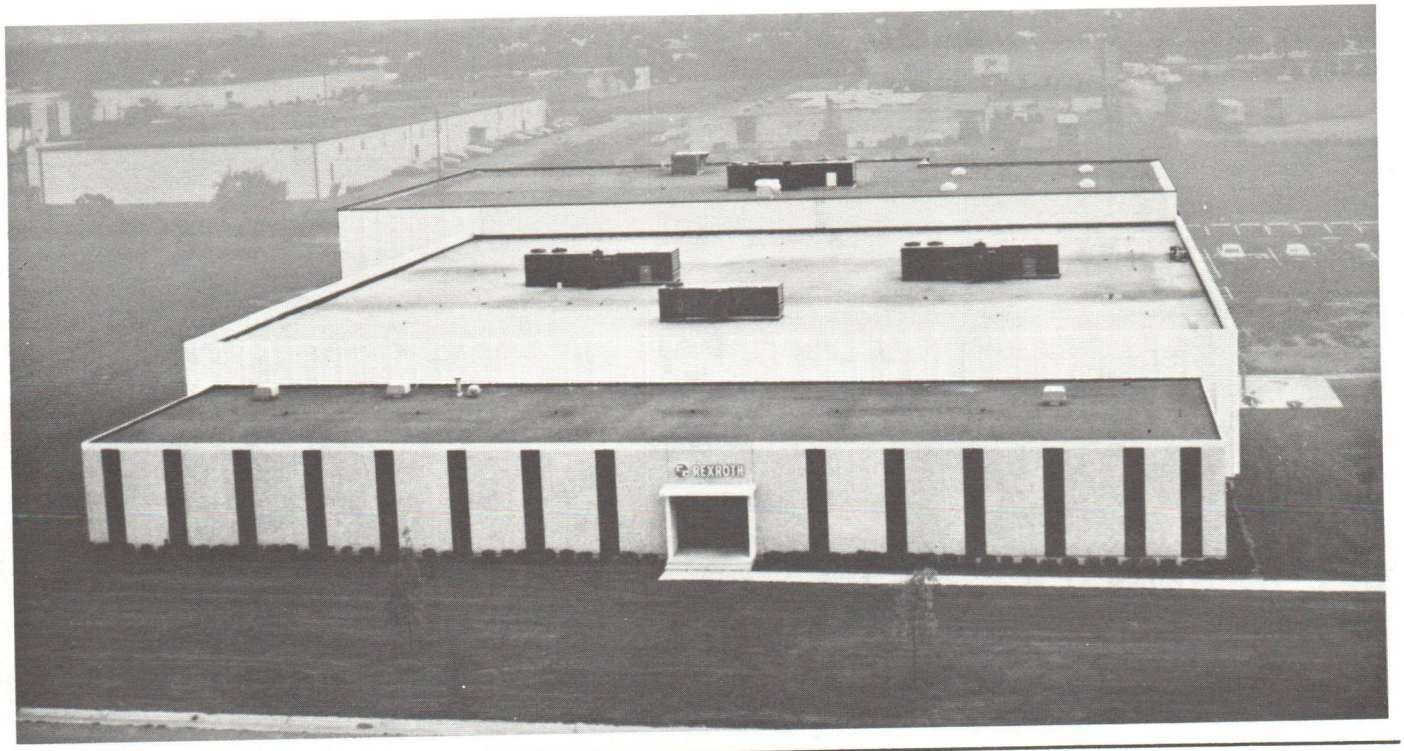
RexrothAmericanStyle

Rexroth has made a major commitment to the American market. Our plant in Bethlehem, Pennsylvania, was recently enlarged to 52,000 square feet, and houses a total hydraulic facility: drafting, power unit construction, component inventory, parts department, fabrication tools, project engineering, start up, service and repair, training classroom facilities, advertising, sales and marketing.

NFPA NATIONAL FLUID POWER ASSOCIATION

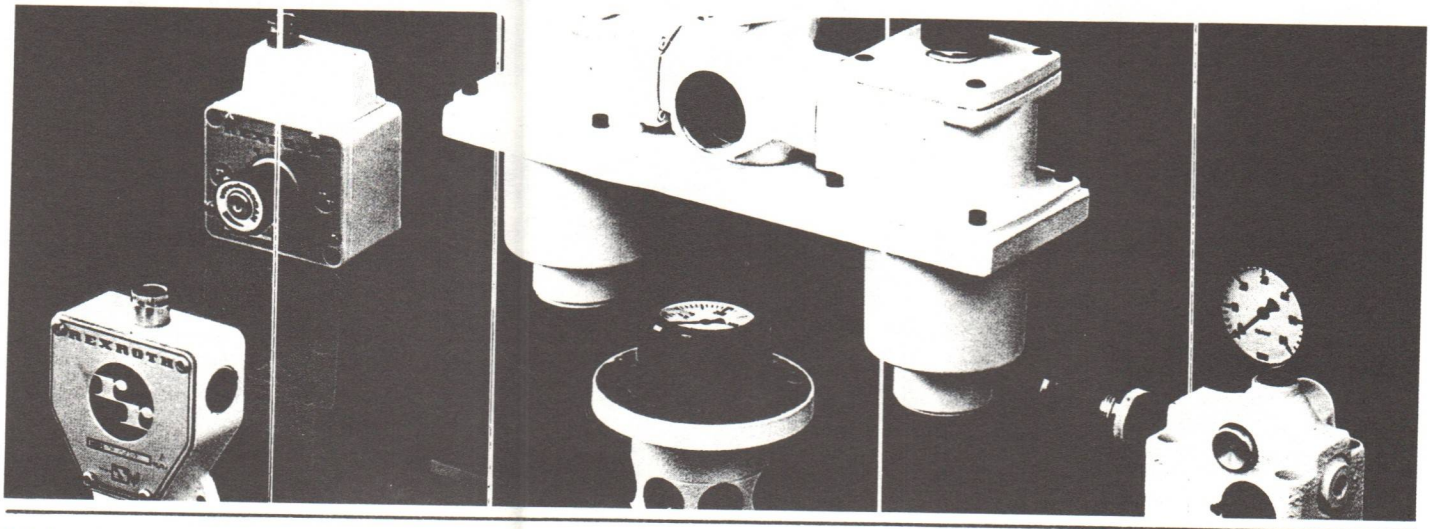






Summary | REXROTH ACCESSORIES

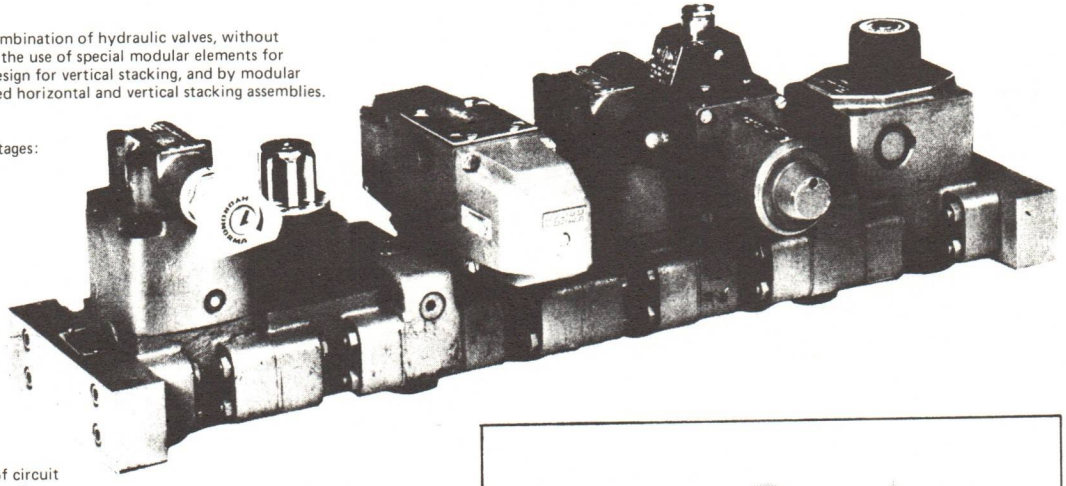
TYPE	REXROTH CODE	DESIGN	SIZE/CAPABILITY	PAGE NO.
MODULE SYSTEMS	VA10, VU10, VT10, VB10	For Manifold Systems Vertical or Horizontal Stacking	Size (10 1/2") up to 3500 PSI	7-1 to 7-5
PRESSURE SWITCHES	HED1, 2 & 3	Hydro-electric, Piston and Bourden Tube Types	1/4" NPT, 22 to 7000 PSI	7-6 to 7-8
	HED4	Direct Piston Operated Adjustable Setting	1/4" NPT, ANSI Sandwich or Manifold Mounting 30 to 5000 PSI	7-9 to 7-11
PRESSURE GAUGE ISOLATOR VALVE	AF6	Three Way, Push-to-Read Spool Valve	1/4" NPT or Subplate Mounting up to 4200 PSI	7-12
MULTI-CIRCUIT GAUGE ISOLATOR	MS2, 4 & 5	Available With or Without Gauge Read-Out	1/4" NPT or SAE up to 4500 PSI	7-13 & 7-14
REMOTE PILOT CONTROLLERS	4TH6	Hand Lever, Wrist Action, Direct Acting Press Reducing Valve	1/4" BSP & 9/16" SAE Operating Range 85 to 275 PSI	7-15 & 7-16
	2TH7R	Foot Pedal, Direct Operated Dual Pressure Reducing Valves	1/4" & 9/16 SAE Operating Range 85 to 435 PSI	7-17 & 7-18
	4TH7	Single or Dual Lever, 1, 2 or 4 Control Ports	1/4" NPT up to 725 PSI	7-19 to 7-22
SUBPLATES & PUMP/MOTOR BRACKETS		For Rexroth Directional Controls, Check Valves, Pressure Controls & Flow Controls Pumps & Motors		7-23
BOLT KITS	BK	For Rexroth Components		7-24



Accessories

General Information On Module Systems

The term "Module Technique" refers to the combination of hydraulic valves, without interconnecting pipework. This is achieved by the use of special modular elements for horizontal stacking, valves of sandwich plate design for vertical stacking, and by modular elements and sandwich type valves for combined horizontal and vertical stacking assemblies.

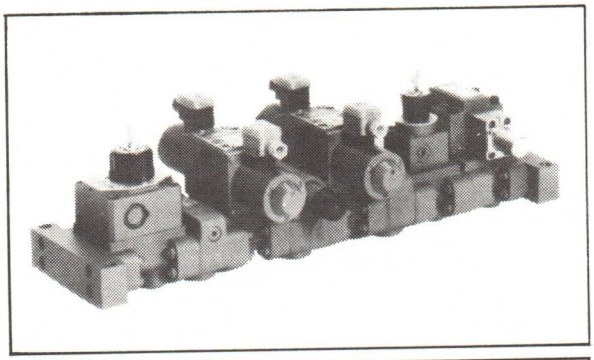


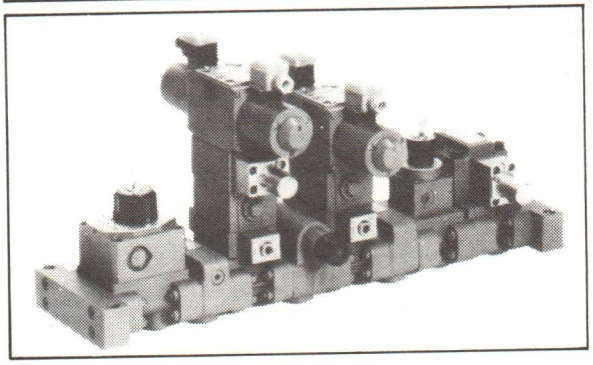
Saving on pipework offers the following advantages:

- reduced space requirement
- reduction of possible leakage points
- easy accessibility
- compact design

Features include:

- 5 oil passage system, adaptable to any type of circuit
- circuit changes can be achieved quickly and easily
- connections to the valves conform to international standards for pressure, flow, directional control and check valves
- operating pressure up to 3500 PSI max., flows to 26 GPM
- size 10(1/2") (RA 48545) for horizontal stacking.
- size 10(1/2"), for vertical stacking.





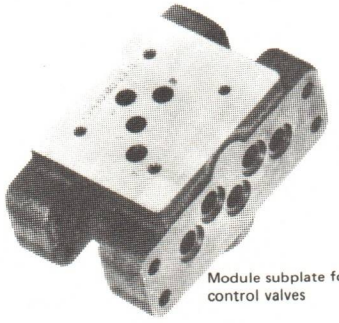
Assembly

The assembly of the module system is always carried out in accordance with the modular circuit (design circuit).

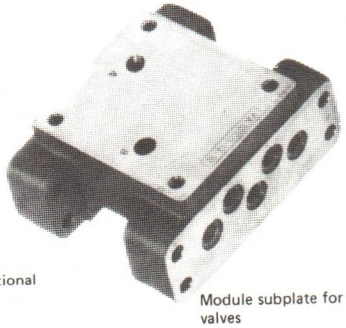
Assembly begins with one of the two end plates, on which the various modular elements are mounted. When the modular elements have been screwed together, the hydraulic valves are then mounted on the appropriate subplates. The mounting position of the individual modular elements is determined from the modular circuit. Dividing plates are fitted between the modular subplates and serve to close oil passages not required.

All threaded connections not required are closed.

Mounting holes are provided in the end plates for installation of the complete assembly.



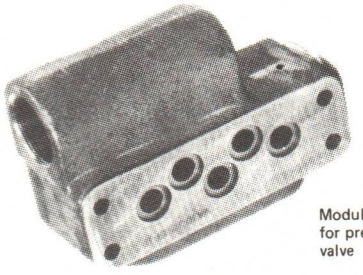
Module subplate for directional control valves



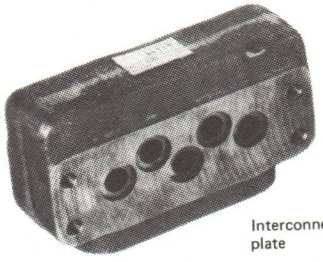
Module subplate for flow control valves

Dividing plate

Mounting plate



Module subplate for pressure relief valve



Interconnecting plate

Symbols

...for hydraulic lines and line connections in module subplates

The symbols of module subplates, inter-connecting plates and end plates are drawn viewed on the valve mounting face of the module subplate. The symmetrical porting pattern in the module subplate enables the subplate assembly to be rotated 180°, therefore there are always two possible variations of each group symbol. The porting details are entered at the dividing line between valve and module subplate.

Main oil passages

Pilot oil passages

Drain oil passages

Connection porting in the valve mounting face of a subplate

Connection porting in an interconnecting plate

Plugged threaded port on line connection side

Open threaded port on line connection side

Connection porting on the valve mounting face and plugged threaded port on line connection side.

Connection porting on the valve mounting face, and open threaded port on the line connection side.

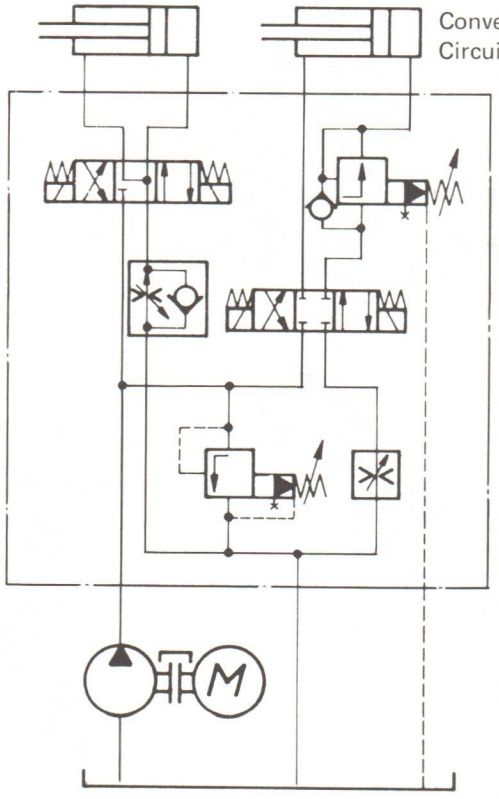
Passage between two adjoining subplates or interconnecting plates blanked off using "blank" dividing plates.

Passage between two adjoining subplates or interconnecting plates continued using drilled dividing plate.

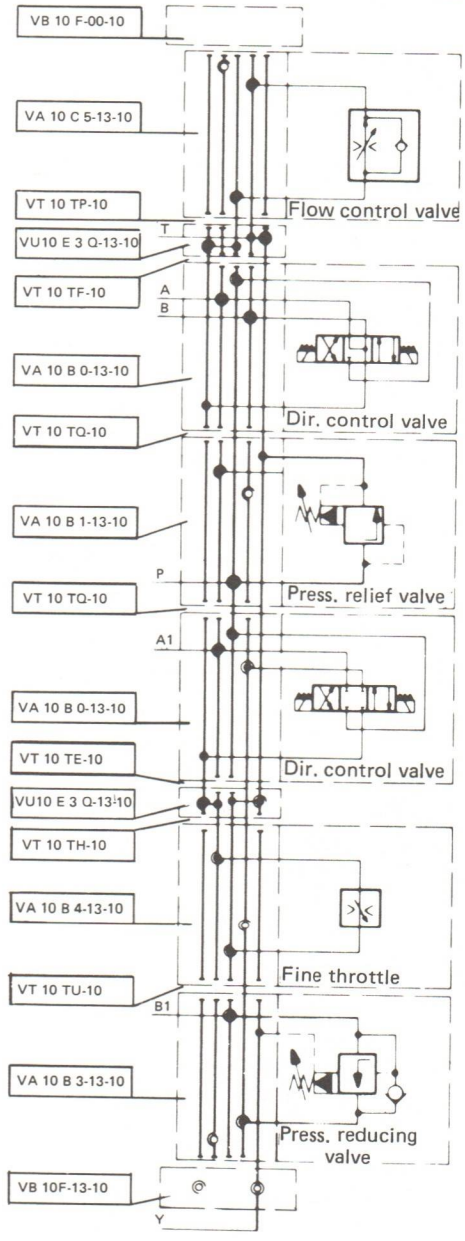
Passage between subplate and valve blanked off.

The maximum length of a size 10 (1/2") assembly can be 40" (horizontal mounting). When the assembly is mounted vertically it may be up to 20% longer. These figures apply only to horizontal stacking assemblies; for combinations of horizontal and vertical stacking these must be reduced by one third.

An advantage of the module technique is that once the design circuit is complete the installation dimensions are also to hand. A conventional circuit, on the other hand, gives no indication of the space required for the installation of the necessary items. (Size of front panel for tank, etc.)



Conventional Circuit



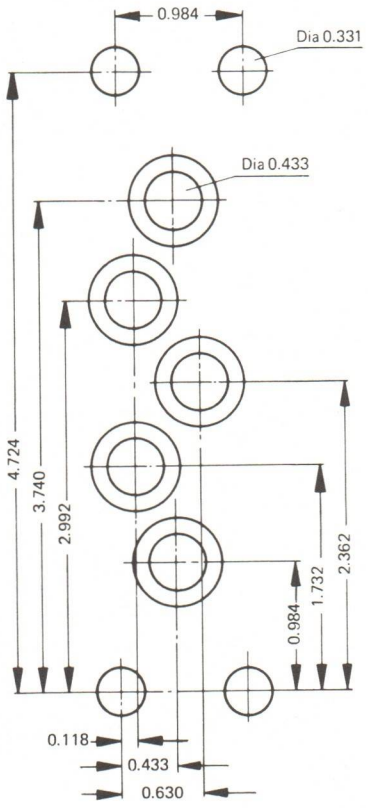
Module Circuit

SUBPLATES

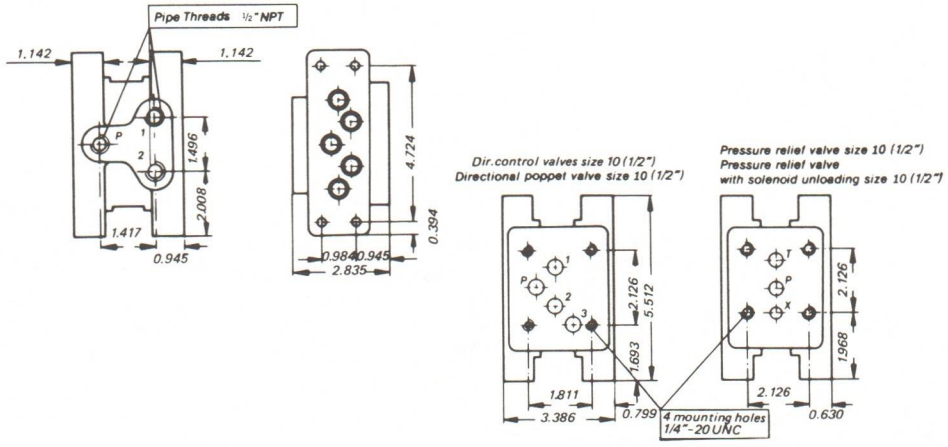
The module connecting face is designed symmetrically, i.e. the module elements can be rotated 180° on the plane of the oil passages. Given optimum design of the module circuit, this feature allows for a saving on interconnecting plates, since rotating the module elements can connect passage 5 with passage 1 or passage 4 with passage 2.

It is recommended to number the oil passages 1, 2, 3, 4 and 5 on a complete module circuit, since when the various hydraulic valves are mounted, it is not possible to determine which oil passage is, for example, the pressure or the service line.

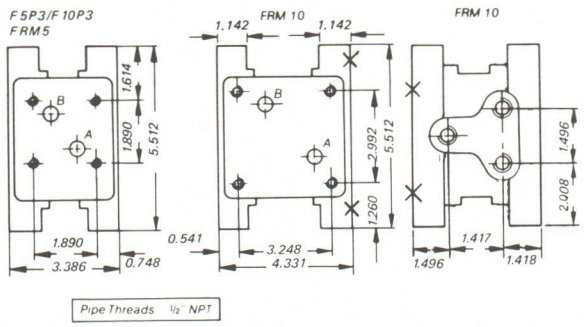
Size 10 (1/2") Module Connecting Face
(Dimensions in inches)



Module Subplate for Directional Controls size 10 (1/2"), Pressure Relief Valves, Pressure Relief Valves with Solenoid Unloading and Directional Poppet Valves size 10 (1/2") (dimensions in inches)



Module Subplates for Flow Control Valves FRM 5, FRM 10 (dimensions in inches)

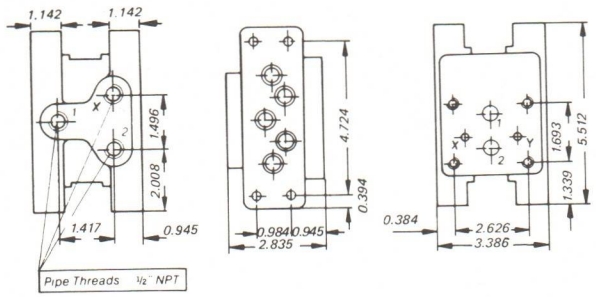


Model Code (ordering details) FRM 5, F 10P3 F 5P3	Pipe Threads	Mounting Holes
VA 10 B 4-53-10	½" NPT	⌀ 10-20 UNC

Model Code (ordering details) FRM 10	Pipe Threads	Mounting Holes
VA 10 C 5-53-10	½" NPT	1/4"-20 UNC

Weight 7.7 LBS

Module Subplates for DR 10, DZ 10, SV 10-Valves (dimensions in inches)

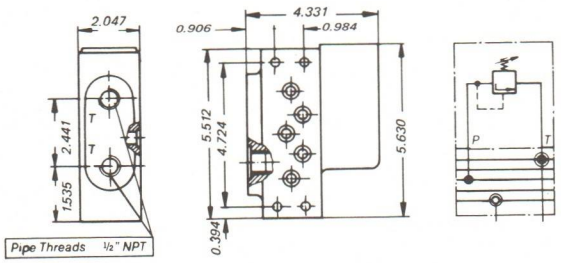


Model Code (ordering details)	Pipe Threads	Mounting Holes
VA 10 B 3-53-10	½" NPT	3/8"-16 UNC

	DR 10	DZ 10	SV 10	SL 10
1	A	P	A	A
2	P	A	B	B

Weight 7.7 LBS

Module Subplate for Pressure Relief Valve DBD 10 (dimensions in inches)



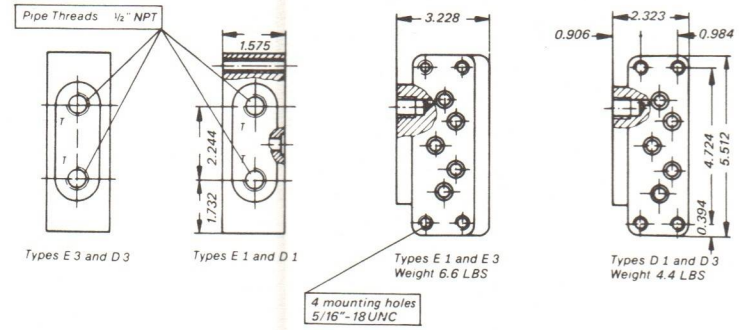
Model Code (ordering details)	Pipe Threads
VA 10 J 2-53-10	½" NPT

Weight 5.5 LBS

REXROTH WORLDWIDE HYDRAULICS

PLATES & SYMBOLS

Inter-Connecting Plates (dimensions in inches)



Types E 3 and D 3

Types E 1 and D 1

Types E 1 and E 3
Weight 6.6 LBS

Types D 1 and D 3
Weight 4.4 LBS

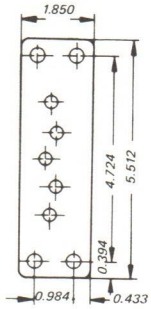
Model Code *(ordering details)*

Group Symbols Normal position	Rotated 180°	Model Code (ordering details)	Group Symbol Normal position	Rotated 180°	Model Code (ordering details)
		VU 10 E 1 C-53-10			VU 10 D 3 P-53-10
		VU 10 D 3 K-53-10			VU 10 E 3 Q-53-10
		VU 10 E 1 L-53-10			VU 10 E 1 S-53-10
		VU 10 D 1 N-53-10			

Dividing Plates (dimensions in inches)

Dividing plates are installed between module subplates, inter-connecting and adaptor plates. As required oil passages in the module assembly can be continued or blanked off

Thickness	0.118
Mounting	4 mounting holes
Weight	0.3 LBS



Model Code *(ordering details)*

Group Symbol Normal position	Rotated 180°	Model Code (ordering details)	Group Symbol Normal position	Rotated 180°	Model Code (ordering details)
		VT 10 TA - 10			VT 10 TL - 10
		VT 10 TB - 10			VT 10 TM - 10
		VT 10 TC - 10			VT 10 TN - 10
		VT 10 TD - 10			VT 10 TP - 10
		VT 10 TE - 10			VT 10 TQ - 10
		VT 10 TF - 10			VT 10 TR - 10
		VT 10 TG - 10			VT 10 TS - 10
		VT 10 TH - 10			VT 10 TU - 10
		VT 10 TJ - 10			VT 10 TV - 10
		VT 10 TK - 10			VT 10 TW - 10

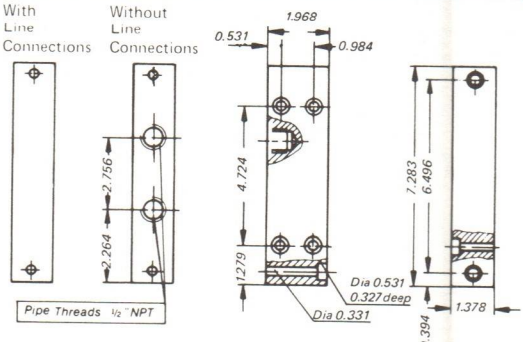
Dividing plate drilled to continue connection between two adjoining plates.

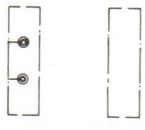
Dividing plate "blanked" to discontinue connection between two adjoining plates.

End Plates (dimensions in inches)

With Line Connections

Without Line Connections





Group Symbols with line connection(s) without

Weight 5.5 LBS

End plates are mounted at each end of the module assembly.

Model Code *(ordering details)*

Model Code (ordering details)	Pipe Threads
VB 10 F-00-10	without line connect.
VB 10 F-53-10	1/2" NPT

VERTICAL & HORIZONTAL STACKING ASSEMBLIES

Mounting Screws For Vertical Stacking Assemblies

Size	Vertical Stacking Assembly comprising:				*Socket Head Cap Screw					max. operating pressure (PSI)
	Directional Control Valve	Flow Valve	Check Valve	Pressure Valve	Qty.	Dia.	Length (in.)	Torque (ft-lb)	Kit-No.	
10 (1/2")	WE 10	Z2FS10-20	—	—	4	1/4"-20NC	3¼"	13.2	VS 10-1	4500
	WE 10	Z2FS10-20	Z2S10-1.2	—	4		4¾"	13.2	VS 10-2	3600
	WE 10	Z2FS10-20	Z2S10-10	—	4		5¼"	13.2	VS 10-4	3600
	WE 10	Z2FS10-20	Z2S10-1.2	ZDR10D..11	4		6¾"	13.2	VS 10-3	3600
	WE 10	Z2FS10-20	Z2S10-10	ZDR10D..11	4		7½"	13.2	VS 10-8	3600
	WE 10	Z2FS10-20	—	ZDR10D..11	4		5¼"	03.2	VS 10-4	4500
	WE 10	—	Z2S10-1.2	—	4		3½"	13.2	VS 10-5	4500
	WE 10	—	Z2S10-10	—	4		4"	13.2	VS 10-7	3600
	WE 10	—	Z2S10-1.2	ZDR10D..11	4		5½"	13.2	VS 10-6	3600
	WE 10	—	Z2S-10	ZDR10D..11	4		6"	13.2	VS 10-9	4500
	WE 10	—	—	ZDR10D..11	4		4"	13.2	VS 10-7	4500

*Based on tensile strength of 19 5000 PSI

Installation and connection dimensions remain the same.

Ordering Example:

(4) S.H.C.S. 1/4"-20NCx4", kit no. VS 10-7

(When ordering always state quantity and part no.)

Components Suitable For Vertical Stacking Systems

Type	Directional Control Valves	Check Valves	Pressure Valves	Flow Valves
SE SE WMM WMD	*RA 22 086 *RA 22 087 *RA 22 300 *RE 22 302			
WE WE	*RA 23 196 *RA 23 197	*RA 21 550	*RA 26 583	*RA 27 517
WE WE WE WE	*RA 23 286 *RA 23 287 *RA 23 299 *RA 23 300			

Components Suitable For Horizontal Stacking Systems

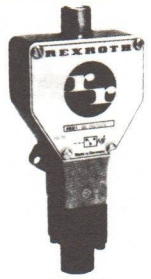
Size	Type	Pressure Valves	direct operated	pilot operated	Type	Flow Valves	direct operated	pilot operated	Type	Directional Control Valves	direct operated	pilot operated	Type	Check Valves	direct operated	pilot operated
10 (1/2")	DBD	* RA 25 400	x		Z2FS	*RA 27 517●	x		SE..	*RA 22 086	x					
									SE..	*RA 22 087	x					
	DB	* RA 25 809		x	FRM	*RA 28 138	x		WMM	*RA 22 300	x					
									WMD	*RE 22 302	x					
	DBE	* RE 25 811		x	FRM	RA 28 383	x				x					
											x					
	DZ	* RA 26 394		x	FRH	*RA 28 385	x		WE	*RA 23 196	x		S^V_L	*RA 21 466	x	
									WE	*RA 23 197	x					
	ZDR	* RA 26 583	x		FRH^F_P	*RA 28 386	x						Z2S	*RA 21 550	x	
	DR	* RA 26 895		x	FRW	*RA 28 387	x		WE	*RA 23 286	x					
					FRW^F_P	*RA 28 388	x		WE	*RA 23 287	x					
				x	FRE	*RA 28 390	x		WE	*RA 23 299	x					
									WE	*RA 23 300	x					

● These valves can only be used in conjunction with the appropriate directional control valves.

*For complete technical information

Accessories

PRESSURE SWITCHES HED 1, 2 and 3



HED 1

HED 2

HED 3

HED 1

Hydro-electric pressure switches type HED 1 serve to switch an electrical circuit on and off dependent of pressure.

The pressure to be monitored acts on a piston, supported by a spring. The spring tension is adjustable. A plunger transfers the piston movement to a micro-switch. A mechanical stop protects the micro-switch from damage in case of excessive pressure.

The model HED 1 . ./. . H is approved for use in intrinsically safe systems.

The pressure switch is available with or without leakage port.

The electrical housing meets nema standard types 3, 3R, 3S and 4 tests.

Refer To **RA 30171**

HED 2

The control pressure acts upon a bourden tube. When the preset pressure is reached, the movement of the bourden tube lever operates a micro-switch. This movement is limited by a mechanical stop, thus preventing damage to the micro-switch in the case of excessive pressure.

The lower switching pressure is adjustable externally by means of a lockable adjustment knob on a pressure-graded dial. The upper switching pressure is calculated from the sum of the lower switching pressure and the constant pressure differential. This pressure switch is particularly suitable for use with small pressure differentials, long periods of pressurization* during which the switch will react to pressure creep. Guaranteed good switching accuracy on repeated operation of the set pressure.

Refer To **RA 30172**

HED 3

The control pressure acts upon a bourden tube. When the preset pressure is reached, the movement of the bourden tube lever operates a micro-switch. This movement is limited by a mechanical stop, thus preventing damage to the micro-switch in the case of excessive pressure.

This model is equipped with two micro-switches. Using an electric relay, the pressure differential is adjustable as required. The lower and the upper switching pressure can be adjusted externally at a self-locking adjustment screw. A tamperproof cap is available for the adjustment screws.

This pressure switch is particularly suitable for use with small pressure differentials, long periods of pressurization*, during which the switch will react to pressure creep. Guaranteed good switching accuracy on repeated operation of the set pressure.

*) Time for which the valve will continue to function correctly when pressurized.

The electrical housing meets nema standard types 3, 3R and 4.

Refer To **RA 30173**

ORDERING CODE

HED 1 K A XX/350 L V/5

TYPE
- 1 = Piston
- 2 = Bourden tube with differential adjustment
- 3 = Bourden tube

K = With drain (HED1 only)
O = Without drain

1/4" NPT

DESIGN SERIES

SEALS
- OMIT = Buna-N
- V = VITON

OPTIONS
- Q = Tamperproof (HED3 only)
- L = Indicator lights
- Z = Plug in electrical connector

MAXIMUM OPERATING PRESSURE FOR HED1K
- 100 = 1500 PSI
- 350 = 5000 PSI
- 500 = 7000 PSI

MAXIMUM OPERATING PRESSURE FOR HED1O
- 50 = 700 PSI
- 100 = 1500 PSI
- 350 = 5000 PSI

MAXIMUM OPERATING PRESSURE FOR HED2 and 3
- 25 = 350 PSI
- 63 = 900 PSI
- 100 = 1500 PSI
- 200 = 2800 PSI
- 400 = 5600 PSI

PRESSURE SWITCHES HED 1, 2 and 3

Technical data

Switching Accuracy	< ±1% of pressure setting
Setting Accuracy (to scale)	±2% of max. pressure setting
Switching accuracy	< ± 2% of pressure setting
Max. switching frequency	HED 1 KA (300/min.) HED 1 OA (50/min.) (briefly also 100/min.)
Electrical conduit connection	1/2" NPT
Hydraulic medium	Mineral oil
Fluid temperature range	–4 to +160° F
Viscosity range	35 to 1750 SSU
Mounting position	Optional
Max. pressure at leakage connection	30 PSI
Insulation: DIN 40 050	IP 65

Contact loading	AC Voltage Volts	AC Voltage Amps	DC Voltage Volts	DC Voltage Amps
	460	15	40	1.0
			125	0.4
			250	0.2

With higher DC voltages arc suppression is recommended to increase working life.

Pressure setting range in PSI Falling pressure min.	Falling pressure max.	Rising pressure min.	Rising pressure max.	Type HED 1 K . . .	Max. working pressure PSI (briefly)
45	1380	90	1500	HED 1 KA 20/100	9000
90	4875	150	5250	HED 1 KA 20/350	9000
150	6975	300	7500	HED 1 KA 20/500	9000

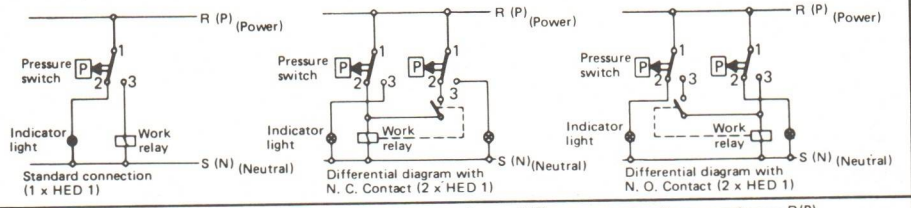
Pressure setting range in PSI Falling pressure min.	Falling pressure max.	Rising pressure min.	Rising pressure max.	Type HED 1 O . . .	Max. working pressure (PSI) (briefly)
30	675	53	750	HED 1 OA 20/ 50	750
45	1230	120	1500	HED 1 OA 20/100	5250
90	4425	300	5250	HED 1 OA 20/350	5250

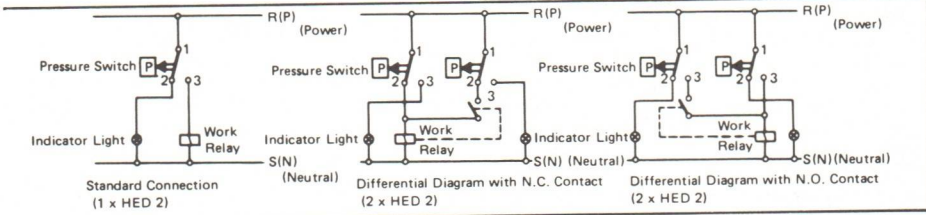
Pressure Setting Range in PSI Falling Pressure min.	Falling Pressure max.	Rising Pressure min.	Rising Pressure max.	Constant Pressure Differential Over Whole Pressure Setting Range in PSI (approx.)	Type HED 2 0	Maximum Working Pressure PSI
22	375	30	382	7	HED 2 OA 10/25	450
60	945	75	960	15	HED 2 OA 10/63	1050
90	1500	112	1522	22	HED 2 OA 10/100	1650
150	3000	210	3060	60	HED 2 OA 10/200	3150
300	6000	390	6090	90	HED 2 OA 10/400	6300

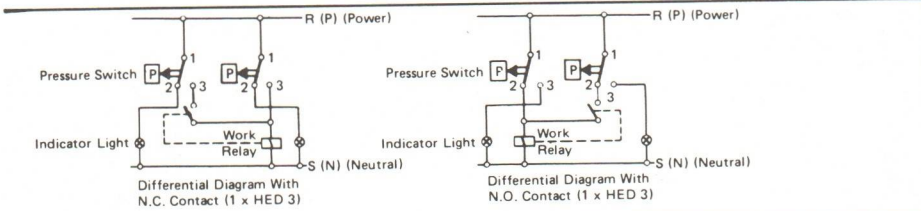
Pressure Setting Range in PSI Falling Pressure min.	Falling Pressure max.	Rising Pressure min.	Rising Pressure max.	Adjustable Pressure Differential in PSI	Type HED 3 0	Maximum Working Pressure PSI
22	375	37	390	min. 15 to max. .352	HED 3 0A 10/25	450
60	945	90	975	min. 30 to max. 885	HED 3 OA 10/63	1050
90	1500	135	1545	min. 45 to max. 1410	HED 3 OA 10/100	1650
150	3000	270	3120	min. 120 to max. 2850	HED 3 OA 10/200	3150
300	6000	480	6180	min. 180 to max. 5700	HED 3 OA 10/400	6300

For applications to other specifications please consult us.

Electrical diagrams

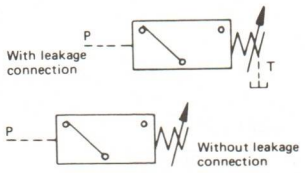

R (P) (Power)
Pressure switch
Indicator light
Work relay
S (N) (Neutral)
Standard connection (1 x HED 1)
Differential diagram with N. C. Contact (2 x HED 1)
Differential diagram with N. O. Contact (2 x HED 1)


R(P) (Power)
Pressure Switch
Indicator Light
Work Relay
S(N) (Neutral)
Standard Connection (1 x HED 2)
Differential Diagram with N.C. Contact (2 x HED 2)
Differential Diagram with N.O. Contact (2 x HED 2)

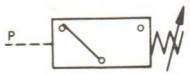

R (P) (Power)
Pressure Switch
Indicator Light
Work Relay
S (N) (Neutral)
Differential Diagram With N.C. Contact (1 x HED 3)
Differential Diagram With N.O. Contact (1 x HED 3)

Symbols

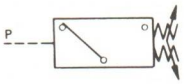
HED 1

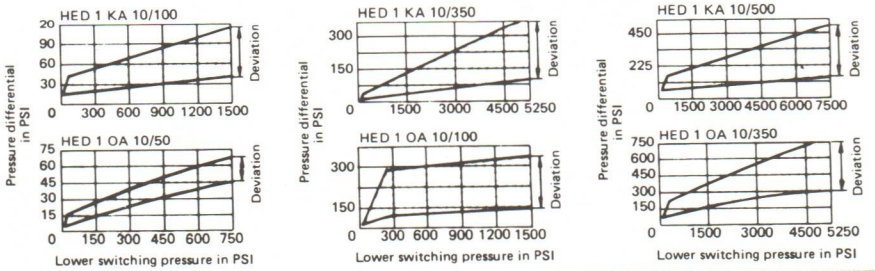


HED 2



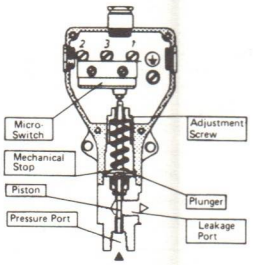
HED 3

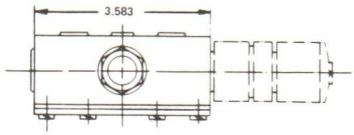


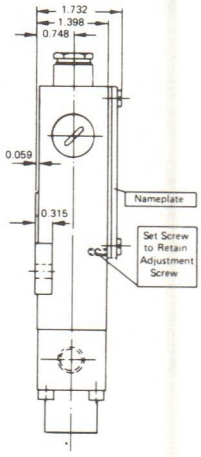


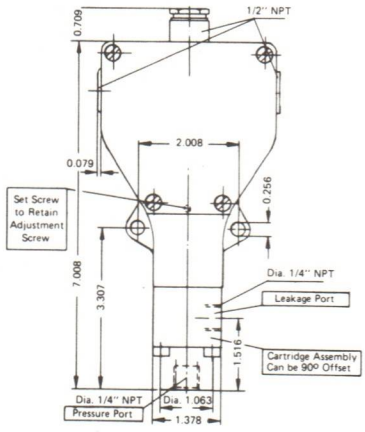
PRESSURE SWITCHES HED 1, 2 and 3

Unit Dimensions (dimensions in inches)



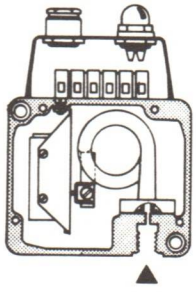


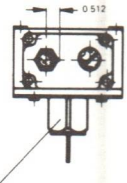




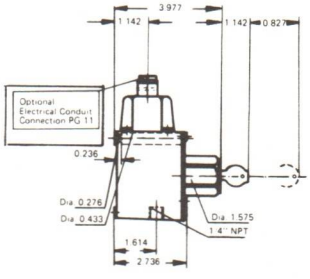
Adjustment:
To adjust switching pressure remove cover and loosen set screw. By turning the adjustment screw with a spanner (A/F 0.472) the switching pressure can be adjusted. Re-tighten grub screw.

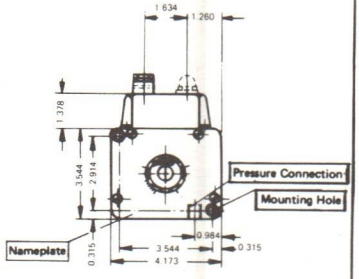
HED 1



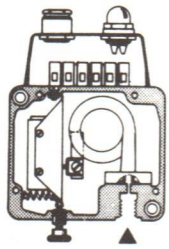


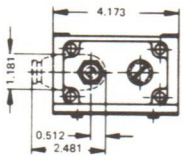
Rotary handknob with lock for adjustment of lower switching pressure to calibrated scale.
The upper switching pressure is calculated from the sum of the lower switching pressure and the constant pressure differential.

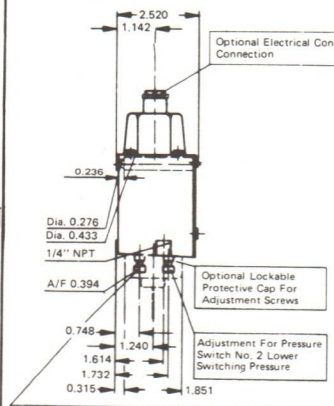


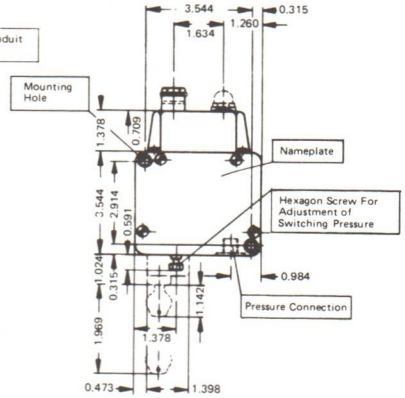


HED 2









Adjustment For Pressure Switch No. 1 Lower Switching Pressure

The pressure switch is fitted with two micro-switches. When using a switching relay the pressure differential is infinitely variable.

HED 3

Accessories

PRESSURE SWITCH HED 4

GENERAL DESCRIPTION . . . The Rexroth type HED 4 is a direct piston operated hydraulic pressure switch. Adjustment of the pressure switch setting is by means of an adjusting nut and sleeve element.

A mechanical stop is built into the assembly to prevent damage should an over pressure occur.

SWITCH CAPACITY . . . AC 250 volt, 5 amperes DC 50 volt, 1 ampere 250 volt, 0.2 amperes
(for DC applications, a suppressor across the line is recommended to increase the service life of the switch.)
SWITCH . . . repeatability accuracy is plus or minus 1% of the pressure setting. . . . frequency -- 120 cycles per minute
SWITCH . . . single pole, double throw (SPDT)
ELECTRICAL CONNECTION . . . plug-in connector.
OPERATING TEMPERATURE . . . -40° F (-20° C) to +160° F (+70° C)
FLUID RECOMMENDATIONS . . . Buna-N seals are supplied as a standard. These seals are suitable for use with petroleum base hydraulic oils; and most water glycol or water-in-oil emulsions.
Viton seals are optional. These seals are compatible with most phosphate ester fluids.
VISCOSITY RANGE . . . 35 SSU (2.8cSt.) to 1750 SSU (380 cSt.)

HED 4 0A10/ . . . Z14 . .
for In-line Mounting

HED 4 OHIO/ . . . Z14 available with optional sandwich plate
Size 6 valves ANSI-D01
Size 10 valves ANSI-D02

MOUNTING POSITION . . . optional

WEIGHT . . . HED 4 Press. Sw. 1.32 pounds (0.6kg)
Sandwich Plate - Size 6 1.8 pounds (0.8kg)
Sandwich Plate - Size 10 4.2 pounds (1.9kg)

HED 4 0 A XX/350 Z14 L110 S V/5

MOUNTING
- P = Manifold
- A = Inline (1/4"NPT)
- **H = Module stacking

DESIGN SERIES

PRESSURE RANGE
- 50 = Up to 750 PSI (50 bars)
- 100 = Up to 1500 PSI (100 bars)
- 350 = Up to 5000 PSI (350 bars)

ELECTRICAL CONNECTORS
- Z14 = Small plug in connector
- Z15 = Large plug in connector (use with pilot lights)

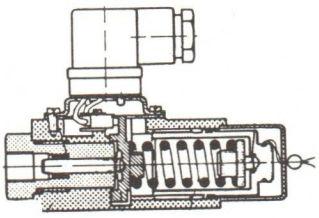
SEALS
- Omit = Buna-N
- V = Viton

PROTECTIVE CAP
- Omit = If not required
- S = Protective cap

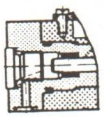
PILOT LIGHTS
(order with Z15 only)
- L24 = 24 volts
- L110 = 110 volts
- L220 = 220 volts

**CODE H - The modular sandwich plate must be ordered separately - see below

	ORDER CODE	Maximum Operating Pressure	- ADJUSTMENT RANGE - Pressure Decreasing	Pressure Increasing
PSI (bar)	50	750 PSI (50 bar)	30 PSI (2 bar) to 675 PSI (46 bar)	60 PSI (4 bar) to 725 PSI (50 bar)
	100	5000 PSI (350 bar)	45 PSI (3 bar) to 1300 PSI (89 bar)	120 PSI (8 bar) to 1450 PSI (100 bar)
	350	5000 PSI (350 bar)	90 PSI (6 bar) to 4600 PSI (322 bar)	300 PSI (20 bar) to 5000 PSI (350 bar)

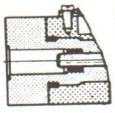


Line threaded 1/4 NPT
HED 4 OA 10/ . . . Z4 . .



Piston

HED 4 OP 10/ . .
for manifold mtg.



Piston

HED 4 OH 10/ . .
for mounting on sandwich plate

PRESSURE SWITCH HED 4

PRESSURE SWITCH ADAPTER PLATES

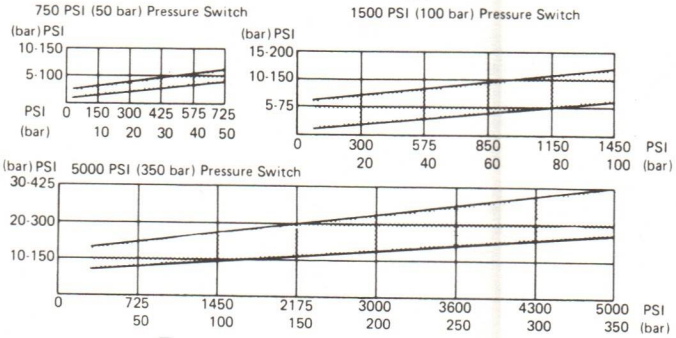
SIZE 6 - Pressure Switch Adaptor Plate (order by part number shown below flow symbol) ANSI - D01

Pressure switch effective in line									
Buna-N	308 400	308 401	308 402	308 403	308 404	308 405	308 406	308 407	308 408
Viton	308 436	308 437	308 438	308 439	308 440	308 441	308 442	308 443	308 444

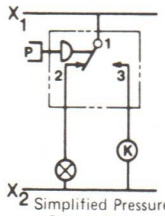
SIZE 10 - Pressure Switch Adaptor Plate (Order by part number shown below flow symbol) ANSI - D02

Pressure switch effective in line									
Buna-N	308 409	308 410	308 411	308 412	308 413	308 414	308 415	308 416	308 417
Viton	308 445	308 446	308 447	308 448	308 449	308 450	308 451	308 452	308 453

PRESSURE DIFFERENTIAL CHART

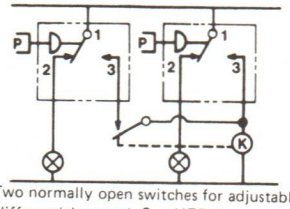


CIRCUIT EXAMPLES for the HED 4 Pressure Switch

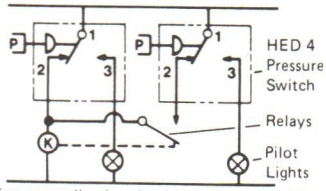


1 - HED 4

Simplified Pressure Switch Circuit



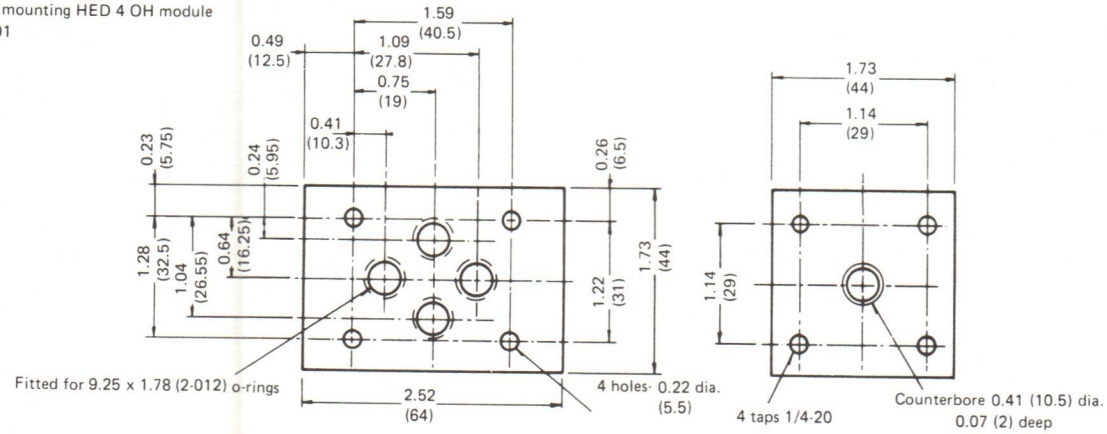
Two normally open switches for adjustable differential control 2 - HED 4



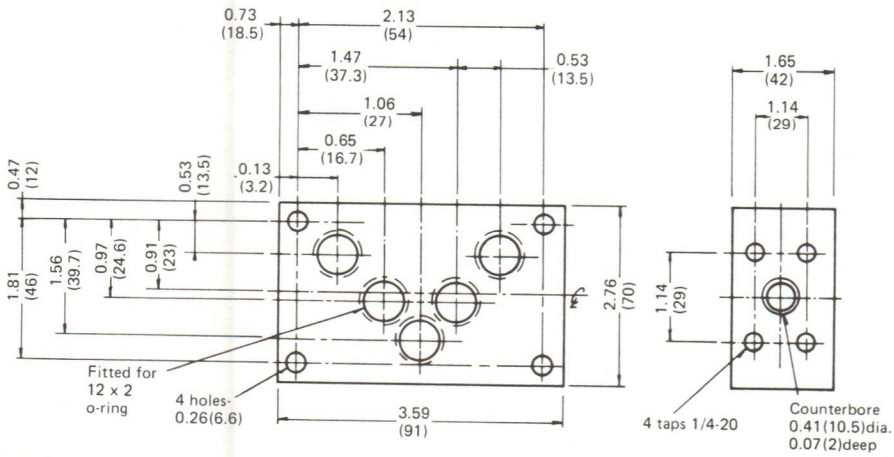
Two normally closed switches for adjustable differential control 2 - HED 4

DIMENSIONS inches (mm)

SANDWICH ADAPTOR PLATE for mounting HED 4 OH module stacking for SIZE 6 valves ANSI-D01



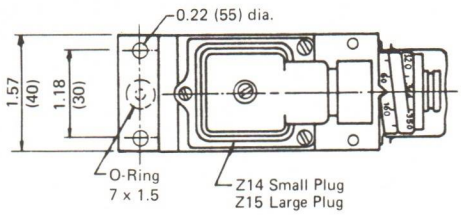
SANDWICH ADAPTOR PLATE for Size 10 Valves ANSI-D02

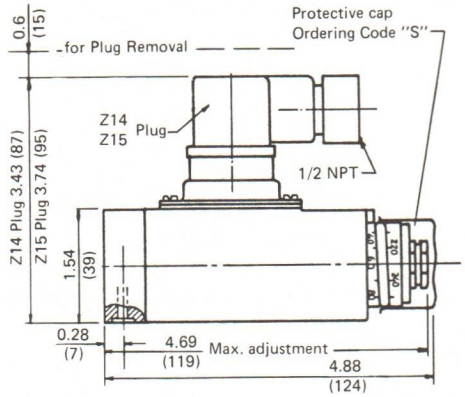


PRESSURE SWITCH HED 4

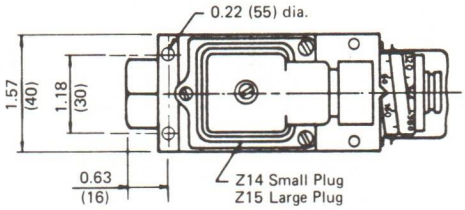
MOUNTING DIMENSIONS

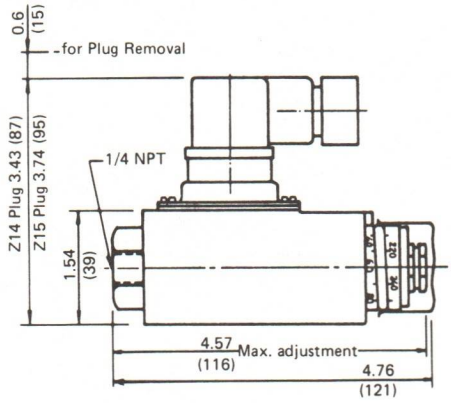
MANIFOLD MOUNTED SWITCH-- Ordering Code "P"



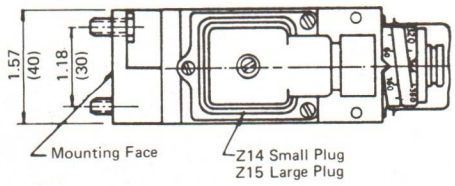


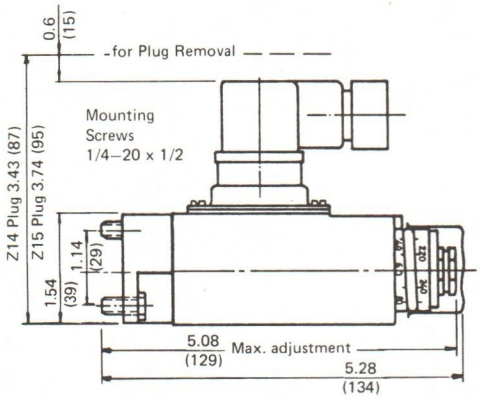
LINE MOUNTED -- Ordering Code "A"





MODULE STACKING--Ordering Code "H"





Accessories

Pressure Gauge Isolator Valve AF6

Description

The pressure gauge isolator valve is a 3-way push to read spool valve. Its purpose is to check prevailing operation pressures from time to time.

The valve has two operating positions and is spring returned to neutral. In the neutral position the pressure source is blocked and the gauge drained to tank.

In the engaged position the pressure flow is directed to the gauge and the tank connection blocked.

The valve is available for subplate or in-line mounting.

The pressure gauge can be screwed into the valve housing or remotely mounted (see installation examples, below).

Ordering Code

AF6E A 2X/X/5 V

CONNECTIONS
- A = In line (1/4" NPT)
- P = Subplate

DESIGN SERIES

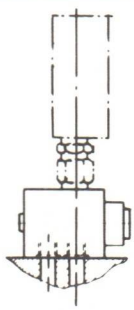
GAUGE MOUNTING
- X = Remote
- Z = Direct
- Y = O-ring seal

SEALS
- OMIT = Buna-N
- V = Viton

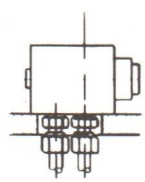
Technical Data

Hydraulic Medium	Mineral Oils
Fluid Temperature Range	-4 to +160°F
Viscosity Range	35 to +1750 SSU
Operating Pressure Range	Up to 4200 PSI
Pipe Connections (P, T and M)	1/4" NPT

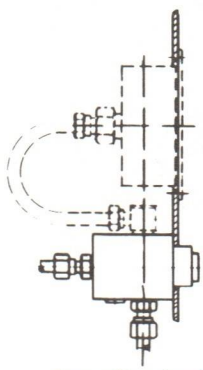
Installation Examples



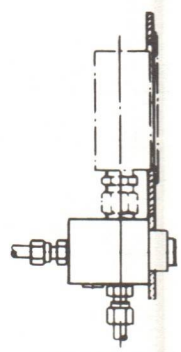
Valve for Sub-plate Mounting with Gauge
Type Af 6 EP 2/X/5



Subplate Mounting (Piped) without Gauge, with Connections
Type Af 6 EA 2/X/5

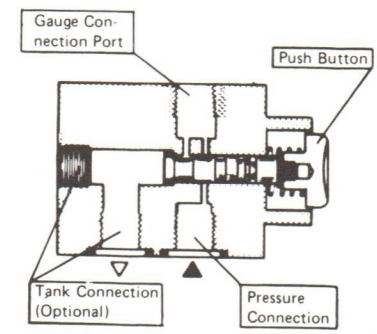


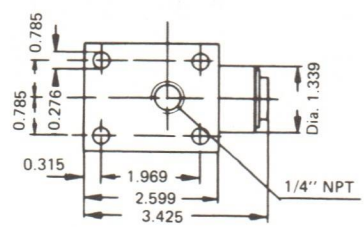
Remote Mounting of Valve and Gauge
Type Af 6 EA 2/X/5

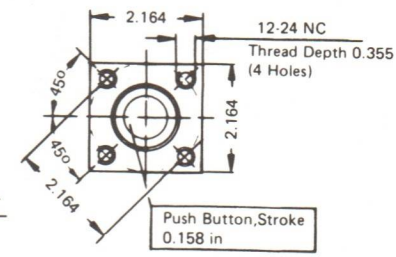


Model for Panel Mount-ing with Anchor Plate
Type Af 6 EA 2/X/5

Unit Dimensions (dimensions in inches)







Accessories

Multi-Circuit Gauge Isolator MS 2, 4 and 5

Description

The multi-circuit gauge isolators Type MS are spool valves. They serve to check the pressure of several circuits with a single gauge. Three models are available.

Multi-circuit gauge isolator Type MS 2 (with 6 connection ports)

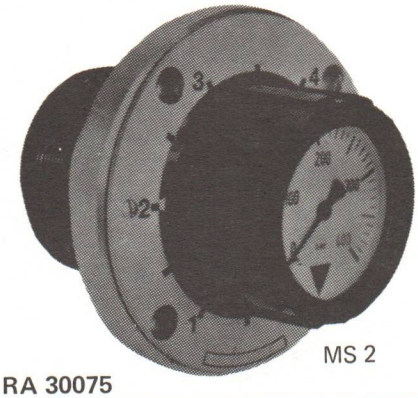
This valve incorporates a glycerine-filled pressure gauge. The pressure points are connected with the gauge by rotating the handknob. Neutral positions are located between the connection ports to unload the gauge.

Multi-circuit gauge isolator Type MS 4 (with 6 connection ports)

This valve has no built-in gauge. A separate gauge can be connected at "M". The pressure points are connected with the gauge by rotating and depressing the handknob. When released the handknob returns to its original position and the gauge is unloaded.

Multi-circuit gauge isolator Type MS 5 (with 5 connection ports)

This valve also has no built-in gauge. As with Type MS 4 a separate gauge can be connected at "M". The pressure points are connected with the gauge by rotating the handknob. One neutral position is located between connections 5 and 1 to unload the gauge. With this model a drain line is required in addition to the tank line. Both pipelines can be interconnected.



MS 2

Refer To **RA 30075**

Ordering Code

M S 2 A XX/4500 V/5

TYPE
- 2 = With built-in gauge
- 4 = Without gauge - rotate and push to read
- 5 = Without gauge - rotate to read

CONNECTIONS
- A = Threaded

DESIGN SERIES

MAXIMUM PRESSURE RANGE
(Use with code "2" only)
- 1000 = 1000 PSI
- 1400 = 1400 PSI
- 4500 = 4500 PSI

SEALS
- Omit = Buna-N
- V = Viton

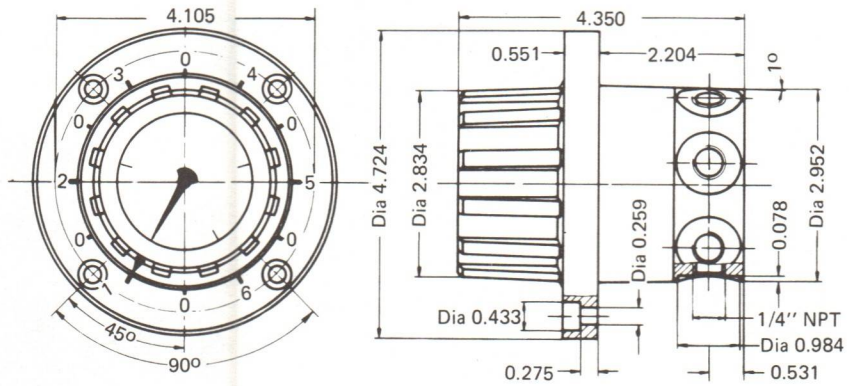
PORTS
- Omit = 1/4" BSP
- 5 = 1/4" NPT (code "2" only)
- 12 = 7/16–20 SAE (code "4" & "5" only)

Technical Data

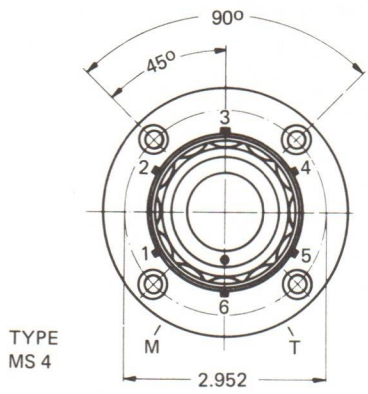
Operating Method	MS 2		MS 4	MS 5
Hydraulic Medium	Mineral Oil			
Fluid Temperature Range	-4 to +160°F			
Viscosity Range	35 to 1750 SSU			
Maximum Operating Pressure	Max. Gauge Pressure Range	Max. Operating Pressure	up to 4500 PSI	up to 4500 PSI
	0 to 1000 PSI 0 to 1400 PSI 0 to 4500 PSI	1400 PSI 2300 PSI 5700 PSI		
The maximum operating pressure corresponds to the maximum scale value of the built-in pressure gauge. Between the maximum value of the gauge pressure range and the maximum scale value the scale is shown in red.				
Maximum Back Pressure At Tank Port	up to 150 PSI			
Maximum Back Pressure At Drain Port				up to 150 PSI
Accuracy Of Built-In Gauge	The indicating accuracy is 1.6% of the red max. scale value at 70°F. The error per additional 35°F temperature increase is +0.3% and per 35°F temperature reduction is -0.3%.			

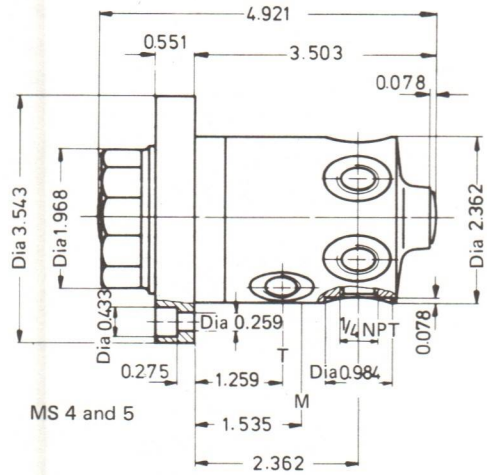
Multi-Circuit Gauge Isolator MS 2, 4 and 5

Unit Dimensions (dimensions in inches)

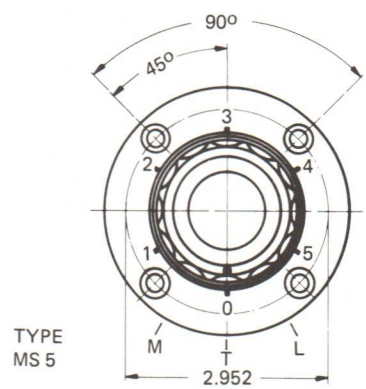


Operation by rotating the knob in either direction and depressing knob..

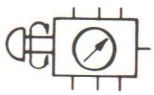




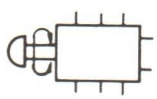
Operation by rotating knob in either direction. One neutral position is located between connection 5 and 1.



Symbols

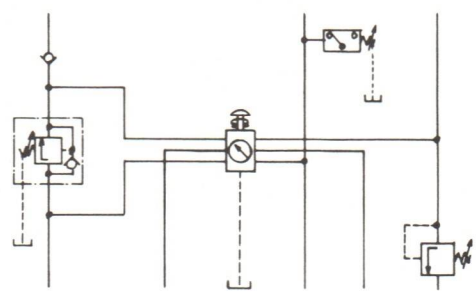


Multi-Circuit Gauge Isolator
With Built-In Gauge



Multi-Circuit Gauge Isolator
Without Built-In Gauge

Example of Application



Pressure is checked before and after a pressure control valve, before a relief valve or in a circuit with built-in pressure switch.

Accessories

Remote Pilot Controller 4TH6

- sensitive control by means of extremely low operating forces and thus an increase in ease of operation
- pilot unit TH 6 enables independent installation of the valve for easy maintenance.
- no expensive rods, smaller lever
- fine control in comparison with manual operation of directional control valves
- positive reference points in the lever position, before start of movement and at the end of fine control
- pilot characteristics remain the same (since no mechanical connections)
- maintenance free
- safety circuits are possible at low cost (via electrical connection)
- all connections on bottom face of unit
- safe return and reduction of response time by direct return of the plunger to neutral position
- stainless steel and brass plunger components offer anti-corrosion and non-stick feature
- the handle, designed from an ergonomic point of view, can be fitted with various electrical contacts, as desired, for additional operations

Refer To **RA 64555**

Type 4 TH6 T..-10/1..

Description

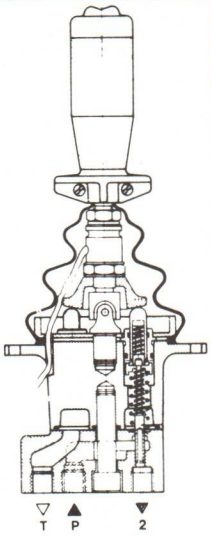
Hydraulic pilot units Type TH 6 operated on the basis of direct operating pressure reducing valves.

Pilot units Type TH6 offer pressure-related fine adjustment of valves, and pump and motor control.

In neutral position, the operating element is held in zero position by return spring. When lever is operated, the plunger is pushed against the return spring by means of the switching plate. At the same time, the regulating spool is pushed through the regulating spring. When the regulating stroke begins, there is a connection from Port P via bore and Ports 1, 2, 3 or 4 to the unit to be adjusted (valve, pump or motor). These adjustments are related to the lever position and the regulating spring characteristic.

A special feature of the TH6 pilot unit is the increase in the fine control range when using Rexroth high pressure mobile control blocks and sandwich mobile control blocks. This range is indicated by definite reference points.

Rubber boot protects the mechanical components from contamination, so that the pilot units are suitable for the most difficult application conditions.



Ordering Code

4TH6 T 06 – XX/ 5 M

OPERATORS
- T = Pistol grip lever
- U = Pistol grip lever w/single contact electric push button
- V = Pistol grip lever w/double contact electric push button
- W = Pistol grip lever w/detents and double contact electric push button

STANDARD CONTROL RANGE

DESIGN SERIES

PORTS
- 1 = 1/4" BSP
- 5 = 9/16–18 SAE

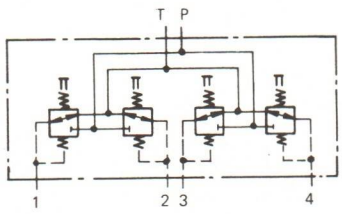
SEALS
- M = Buna-N
- V = Viton

Technical Data

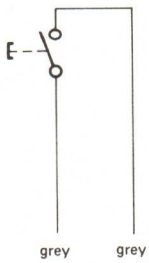
Input Pressure	730 PSI
Backpressure at Port T	45 PSI
Pilot Oil Flow	4 GPM
Hystersis	15 PSI
Hydraulic Medium	Mineral Oils Phosphate Ester
Fluid Temperature Range	-40°F to +160°F
Viscosity Range	35 SSU to 1750 SSU
Switching Power of Switch ⎓ DC	30 V 5 A
Switching Power of Switch ~ AC	125 V 10 A or 250 V 10 A
Weight	6 lbs.

Hydraulic & Electrical Symbols

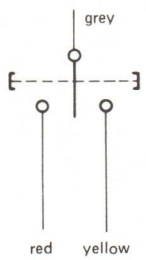
Operation T, U, V, W



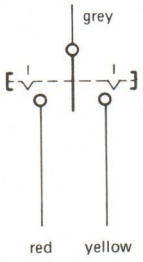
Operation U



Operation V

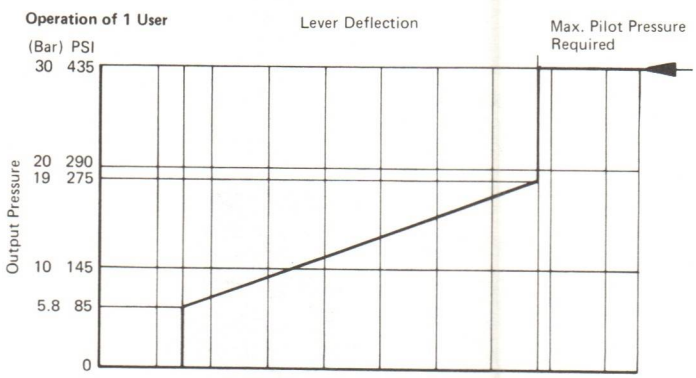


Operation W



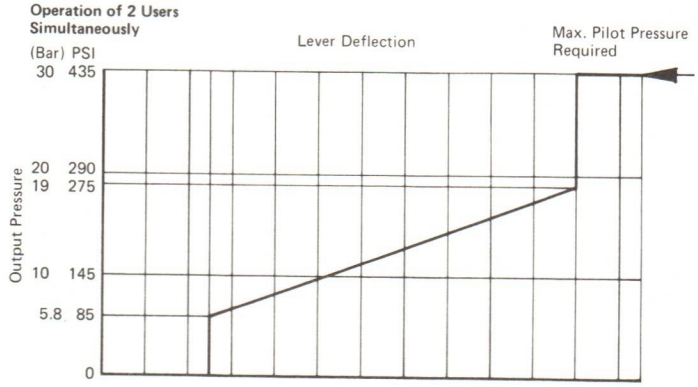
Remote Controller 4TH6

Regulation Ranges, Operation Forces



Regulating Curve Coefficient 06

This curve is used for remote control of high pressure and sandwich mobile control blocks.



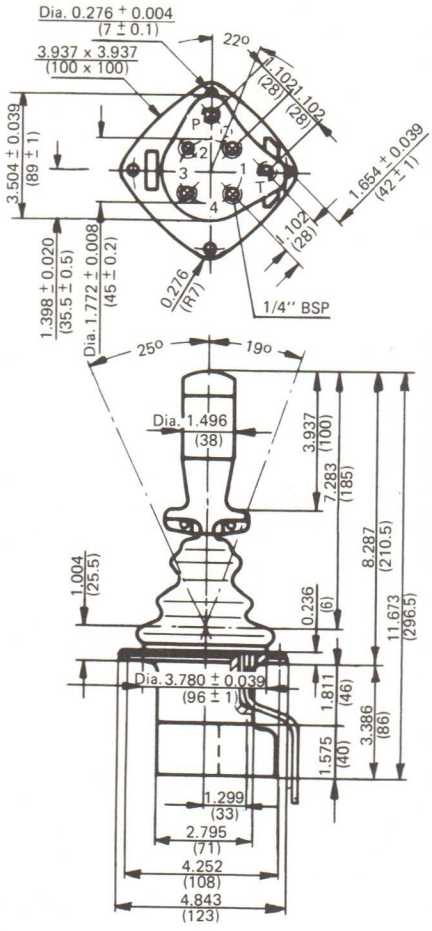
Regulating Curve Coefficient 06

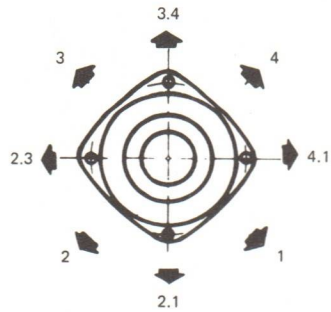
This curve is used for remote control of high pressure and sandwich mobile control blocks.

Unit Dimensions inches (mm)

Type T, 1 lever central, pistol grip type

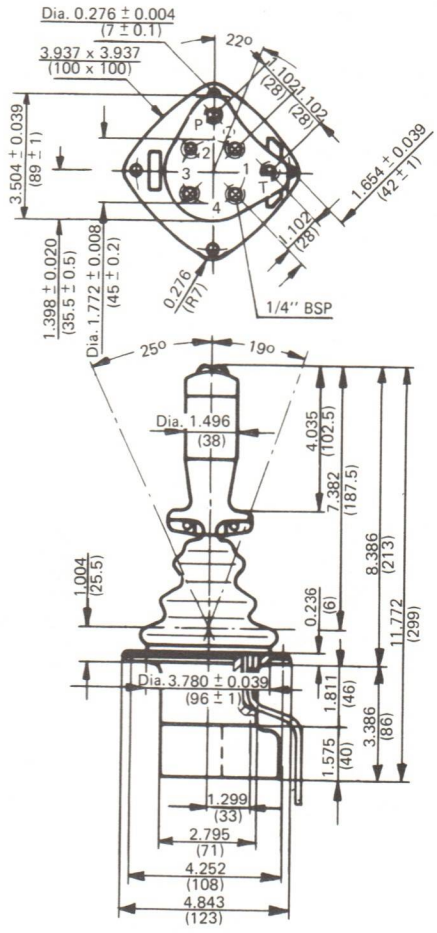
Type U, 1 lever central, pistol grip type and single electrical contact (push button)





Type V, 1 lever central, pistol grip type and double electrical contact (rocker), spring return

Type W, 1 lever, pistol grip type and double electrical contact (rocker), with detent



Accessories

Remote Pilot Controller 2TH7R

GENERAL DESCRIPTION..The model 2TH7R foot operated valve consists of two individual direct operated pressure reducing valves.

When pressure regulation starts, pressure from Port P flows through the passage of the regulating spool to either Ports 1 or 2 depending on operators selection as to the directional motion of the pedal. When the pedal is in the neutral position, Ports 1 and 2 drain to the tank port, the port is blocked.

This valve, utilized extensively in mobile applications is for the remote operation of valves, pumps and motors. The 2TH7R Pilot Valve has been designed to provide a proportional control of pressure actuating devices of valves and pumps.

Electrical safety circuit switches are available in this assembly, consult the factory.

The 2TH7R Pilot Valve has No. 6 SAE Port connections.

INLET PRESSURE, P Port...725 PSI (50 bar) max.
T Port 45 PSI (3 bar) max.

OPERATING PRESSURE...Pressure range 85 PSI (5.8 bar) to 435 PSI (30 bar) at Ports 1 & 2.

OPERATING TEMPERATURE...-4°F (-20°C) to +160°F (+70°C)

FLOW RATING...5 GPM (20 l/min)

VISCOSITY RANGE...35 SSU (2.8cSt) to 1750 SSU (380cSt)

MOUNTING POSITION...Optional

PORTING...P, T, 1 & 2--9/16-18UNF–2B (SAE Size 6)

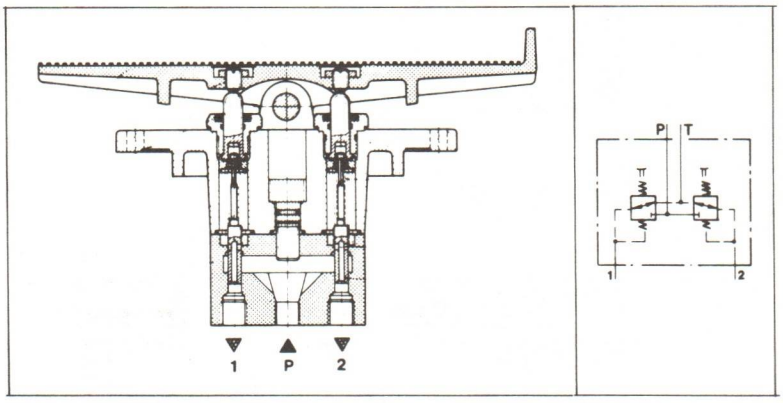
FLUID RECOMMENDATIONS...Buna-N seals are supplied as a standard. These seals are suitable for use with petroleum base hydraulic oils; and most water glycol or water-in-oil emulsions.

Viton seals are optional. These seals are compatible with most phosphate ester fluids.

WEIGHT...7 pounds (3.2 kg)

Refer to: **RA 64561**

Type 2 TH7 R..-10/1..



Ordering Code

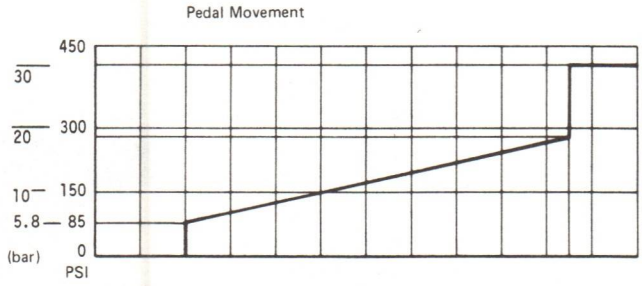
2TH7R 06 – XX/ 5 M

- **CONTROL RANGE**
  - 06 = Standard control range
- **DESIGN SERIES**
- **PORTS**
  - 1 = 1/4" BSP
  - 5 = 9/16–18 SAE
- **SEALS**
  - M = Buna-N
  - V = Viton

Remote Pilot Controller 2TH7R

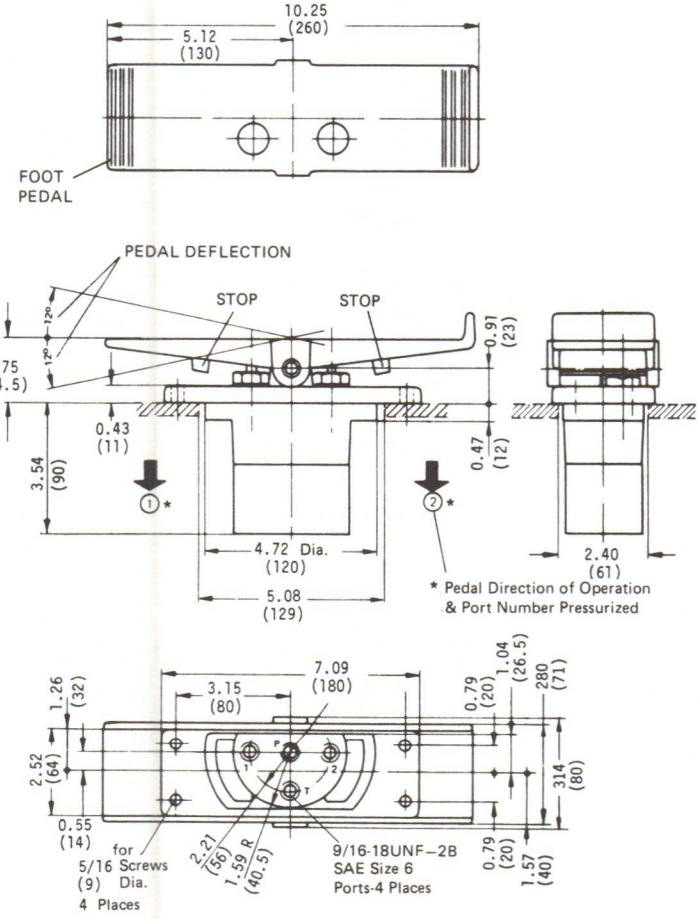
Performance Curves

PEDAL OPERATING FORCE by degree of pedal movement STD. CONTROL RANGE "06" 435 PSI (30 bar) is the maximum pilot pressure required to pilot the valves, pumps or motors.



STANDARD CONTROL RANGE "06"
The above curve is used for the remote control valving of the Rexroth high pressure and sandwich mobile control valves.

Installation Dimensions: Inches (mm)



Accessories

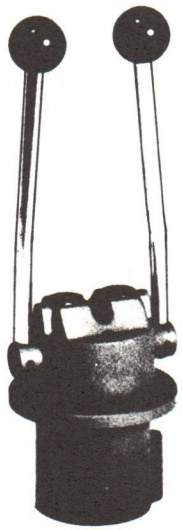
Remote Pilot Controller 4TH7

ADVANTAGES

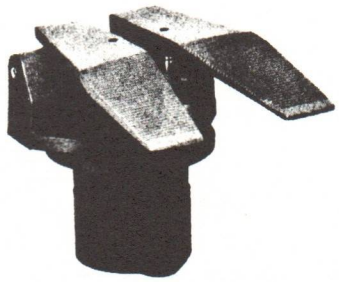
- sensitive control by means of extremely low operating forces and thus an increase in ease of operation
- pilot unit TH7 enables independent installation of the valve for easy maintenance
- no expensive rods, smaller lever
- fine control range can be increased in comparison with manual operation of directional control valves
- positive reference points in the lever position, before start of movement and at the end of fine control
- pilot characteristics remain the same (since no mechanical connections)
- maintenance free
- safety circuits are possible at low cost (via electrical connection)
- operating cartridges can be easily interchanged
- all connections on bottom face of unit
- safe return and reduction of response time by direct return of the plunger to neutral position
- stainless steel and brass plunger components offer anti-corrosion and non-stick feature

Refer To **RA 64558**

4 TH7 N..-10/1..



4 TH7 G..-10/1..



4 TH7 Q..-10/1..

Description

Hydraulic pilot units Type TH7 operate on the basis of direct operating pressure reducing valves.

Pilot units Type TH7 offer pressure-related fine adjustment of valves, and pump and motor control.

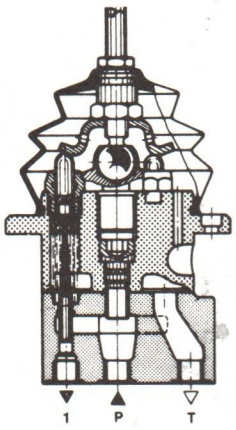
In neutral position, the operating element is held in zero position by return spring. When lever is operated, the plunger is pushed against the return spring by means of the switching plate.

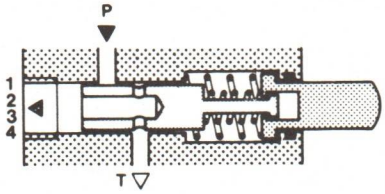
At the same time, the regulating spool is pushed through the regulating spring. When the regulating stroke begins, there is a connection from Port P via bore and Ports 1, 2, 3 or 4 to the unit to be controlled (valve, pump or motor). These adjustments are related to the lever position and the regulating spring characteristic.

A special feature of the TH7 pilot unit is the increase in the fine control range when using Rexroth high pressure mobile control blocks and sandwich mobile control blocks. This range is indicated by definite reference points.

Rubber boot protects the mechanical components from contamination, so that the pilot units are suitable for the most difficult application conditions.

Simple maintenance of the pilot units is ensured by the operating cartridges, which are easily interchangeable.





Technical Data

Inlet Pressure		730 PSI		
Backpressure at Port T		45 PSI		
Pilot Oil Flow		5 GPM		
Hysteresis		15 PSI		
Hydraulic Medium		Mineral Oils Phosphate Ester		
Fluid Temperature Range		-40°F to +160°F		
Viscosity Range		35 SSU to 1750 SSU		
Switching Power	– DC	30 V 5 A		
	– AC	125 V 10 A or 250 V 10 A		
Weight	1 Lever Central 7 lbs.	1 Lever on Side 7 lbs.	2 Levers on Side 8 lbs.	2 Pedals 14 lbs.

Ordering Code

4TH7 A 06 XX/ 5 M

NUMBER OF CONTROL PORTS
- 1 = 1 control port
- 2 = 2 control ports
- 4 = 4 control ports

OPERATORS
- A = Central joystick lever (ball joint) - 4 ports
- B = Central joystick lever (universal joint) - 4 ports
- C = Central joystick lever w/elec. push button - 4 ports
- G = 2 side levers (spring return) - 4 ports
- H = 2 side levers (detented) - 4 ports
- J = 2 side levers w/lock in any position - 4 ports
- K = 2 side levers w/friction clutch - 4 ports
- L = 1 side lever (spring return) - 2 ports
- M = 1 side lever (detented) - 2 ports
- N = 1 side lever w/lock in any position - 2 ports
- P = 1 side lever w/friction clutch - 2 ports
- Q = 2 foot pedals - 2 ports
- Z = Elements without operations
- 1 = 1 port
- 2 = 2 ports
- 3 = 4 ports

DESIGN SERIES

CONTROL RANGE
- 05 = 72.5 - 304.5 PSI
- 06 = 84.0 - 275.5 PSI
- 09 = 43.5 - 130.5 PSI
- 10 = 2 step a = 72.5 - 196 PSI; b = 196 - 652.5 PSI

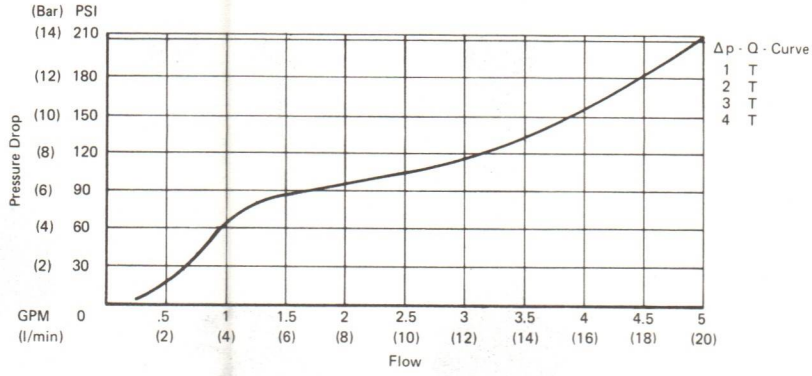
PORTS
- 1 = 1/4" BSP
- 5 = 9/16–18 SAE

SEALS
- M = Buna-N
- V = Viton

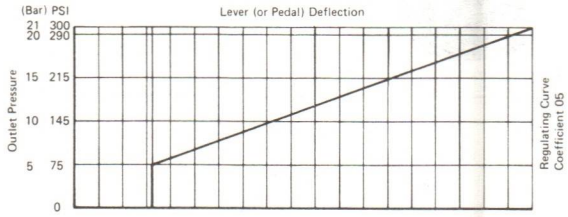
Assembly with Viton Seals

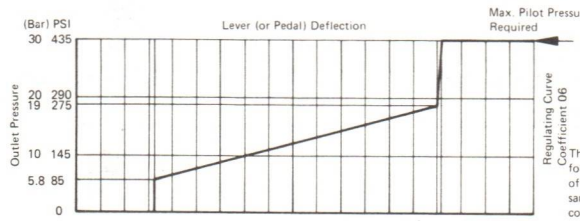
Remote Pilot Controller 4TH7

Performance Curves

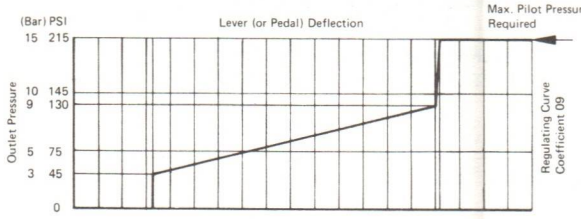


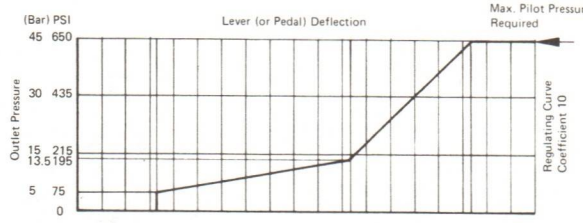
Performance Curves: Control Ranges, Operating Forces Manual Operation, 1 Lever Central, Operation of One User (Type A, B, C)





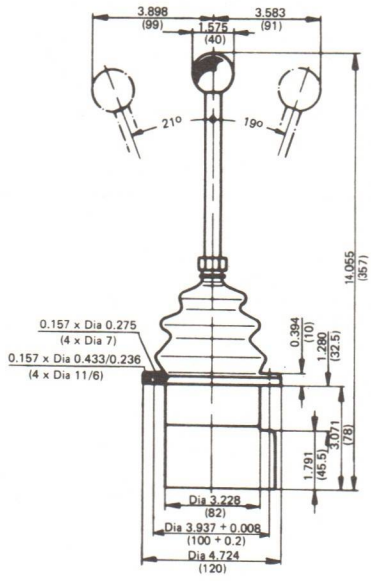
This curve is used for remote control of high pressure and sandwich mobile control blocks.



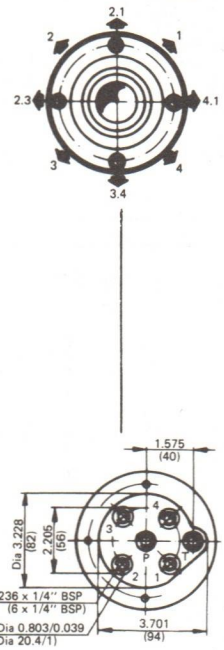


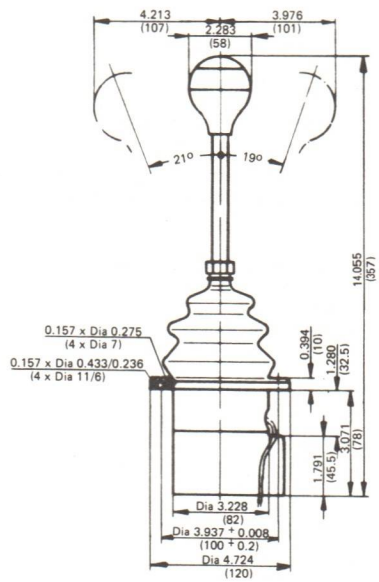
Unit Dimensions inches (mm)

Type A, 1 Lever Central, Joystick Type
Type B, 1 Lever Central, Joystick Type



Type C, 1 Lever Central, Joystick Type

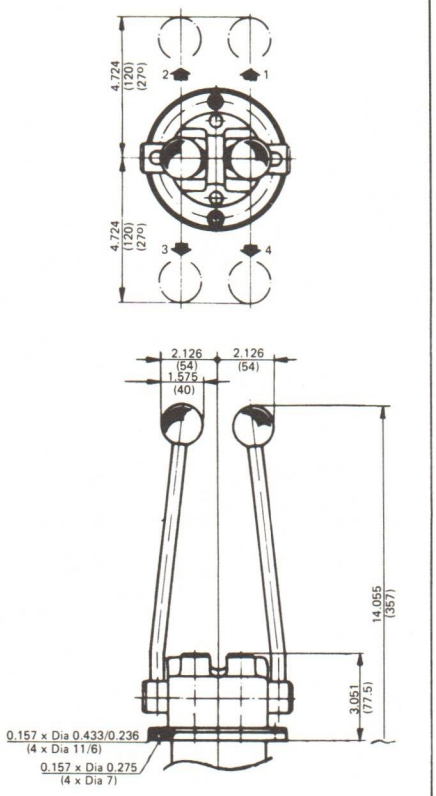




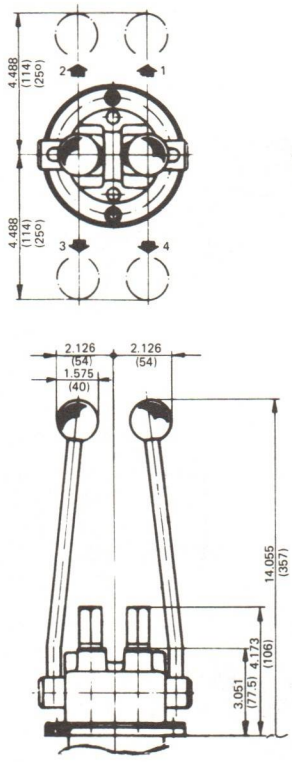
Remote Pilot Controller 4TH7

Unit Dimensions inches (mm)

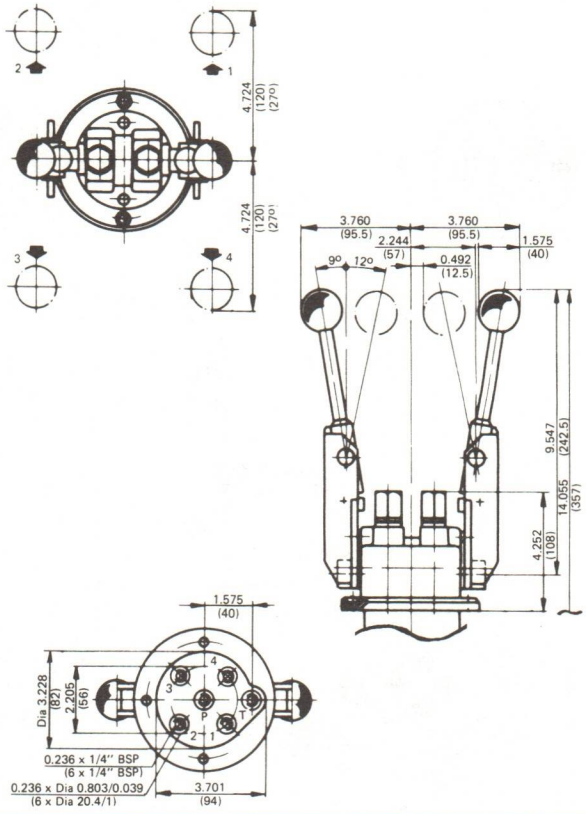
Type G, 2 Levers on Side, with Spring Return



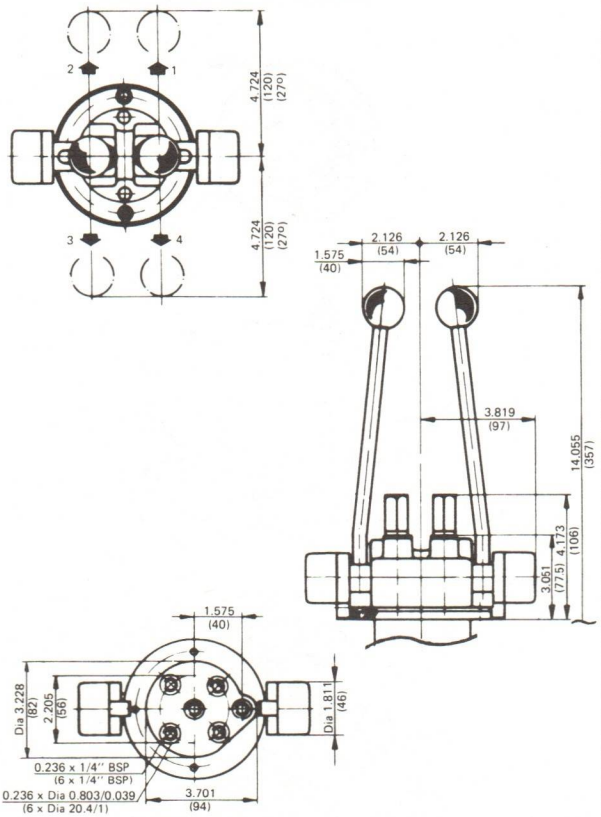
Type H, 2 Levers on Side, with 3 Position Detent



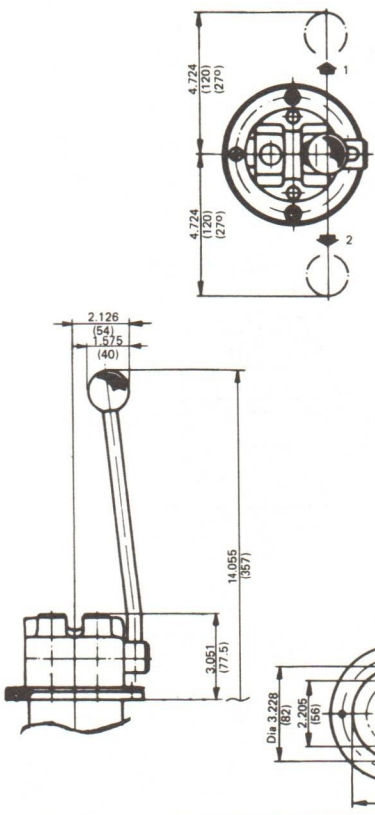
Type J, 2 Levers on Side, with Stop and Release in Any Position



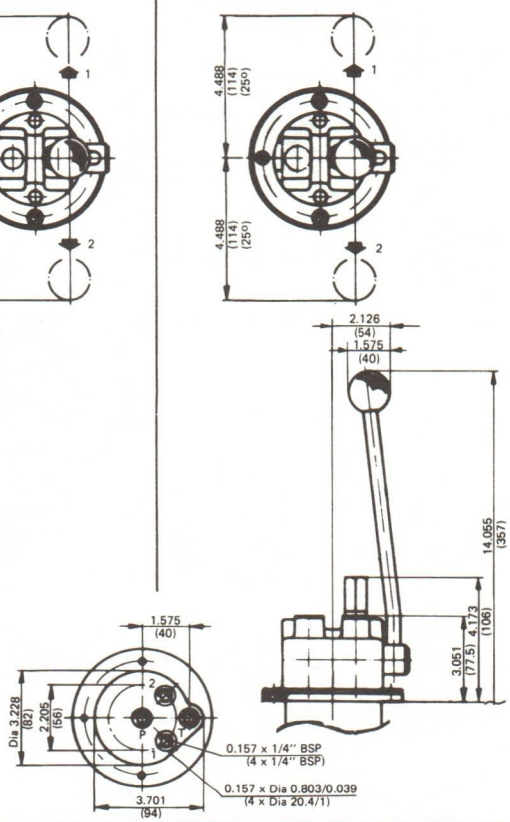
Type K, 2 Levers on Side, Can be Fixed in Any Position by Means of Friction Clutch



Type L, 1 Lever on Side, with Spring Return



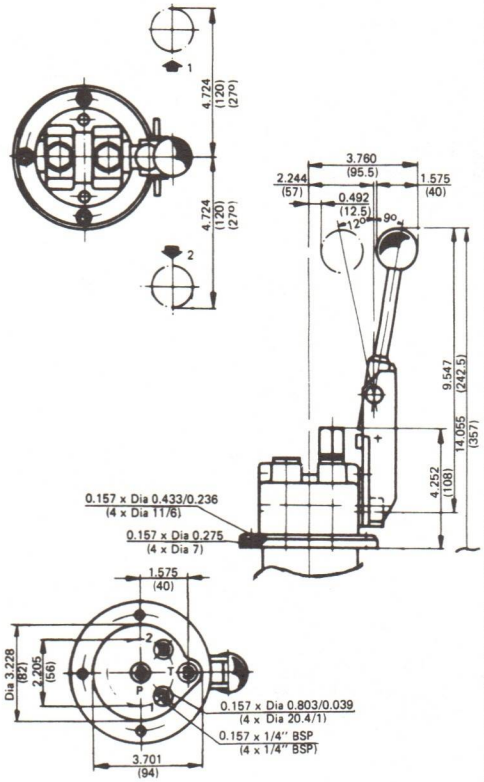
Type M, 1 Lever on Side, with 3 Position Detent



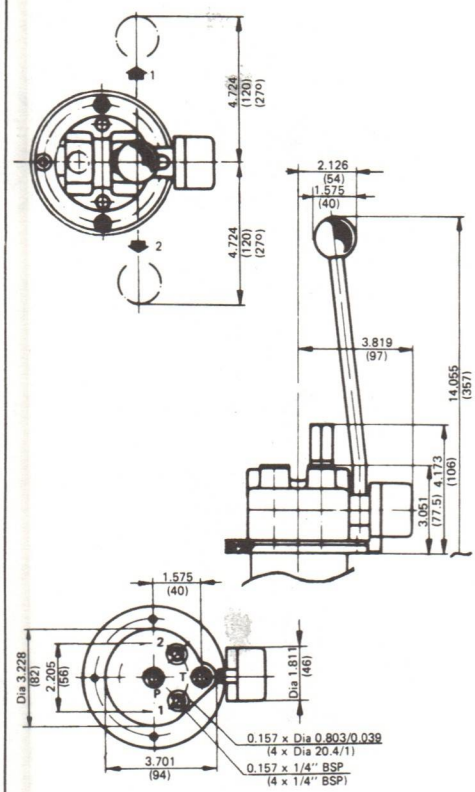
Remote Pilot Controller 4TH7

Unit Dimensions inches (mm)

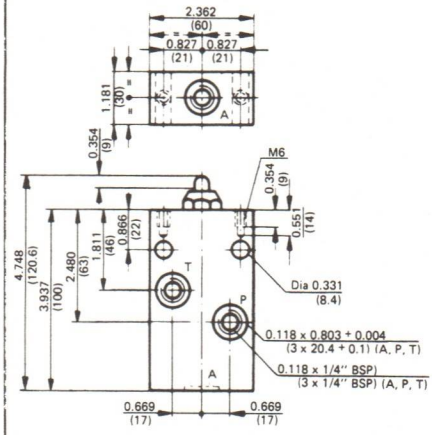
Type N, 1 Lever on Side, Can be Stopped and Released in Any Position



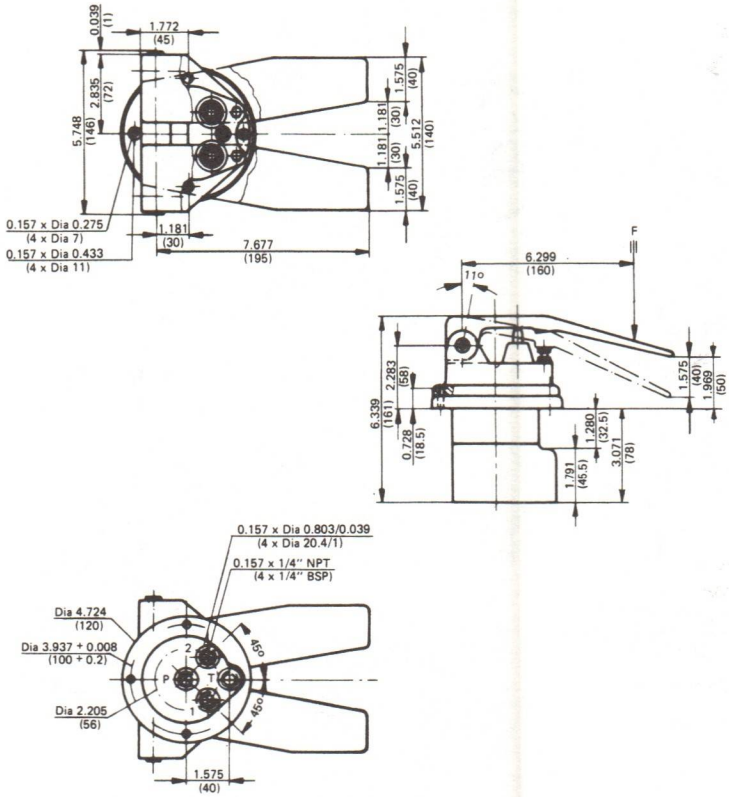
Type P, 1 Lever on Side, Can be Fixed in Any Position by Means of Friction Clutch



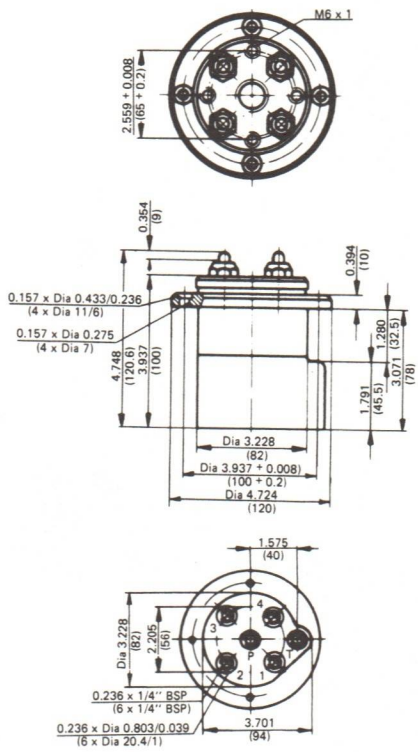
Type 1 TH7 Z, without Operating Element



Type Q, 2 Independent Pedals, Individually Operated



Type 2 TH7 Z, without Operating Element
Type 4 TH7 Z, without Operating Element



Pump/Motor accessories

PUMP/MOTOR BRACKETS

V2-10 THRU 36 (SINGLE PUMP BRACKET)	303507 303511 303515	Bolts Incl.
V2-10 THRU 36 (DOUBLE PUMP BRACKET)	303508 303512 303516	Bolts Incl.
V2-50 THRU 100 (BRACKETS FOR ALL PUMPS)	303563 303543 303545 303547	Bolts Incl.
V3-25 (SUBPLATE)	G 182/184-8 G 213/215-8	BK-B-9
V3-40 (SUBPLATE)	G 213/215-12	BK-B-10
V3-63 (SUBPLATE)	G 213/215-20	BK-B-11
V3-12 (STD BRACKET)	145913 (ISO)	BK-B-47
V3-25 (STD BRACKET)	304766 (ISO)	BK-B-48
V3-40 (STD BRACKET)	145912 (ISO)	BK-B-49
V3-63 (STD BRACKET)	145912 (ISO)	BK-B-50

HEAVY DUTY (ISO)

V3-12	810201 810202	MOTOR FRAME	143/145 182/184
V3-25	810150 810053		182/184 213/215
V3-40 & 63	810190 810038		213/215 254/256

HEAVY DUTY (SAE)

V3-25	810188 810189	MOTOR FRAME	182/184 213/215
V3-40 & 63	810191 810190		213/215 254/256

Bolts Incl'd. w/All HD Brackets

STANDARD BRACKETS

V4-20	304766 (ISO)	BK-B-48
V4-32	145912 (ISO)	BK-B-51
V4-50	810192 (SAE)	Bolts Incl.
V4-80	831698 (ISO)	BK-B-52
V4-125	810204 (ISO)	Bolts Incl.

HEAVY DUTY (ISO)

V4-20	810150 810033	MOTOR FRAME	182/184 213/215
V4-32	810190 810038		213/215 254/256
V4-50	810038 810043		254/256 284/286
V4-80	810195 810196 810067		254/256 284/286 324/326
V4-125	810204 810068		324/326 364/365

HEAVY DUTY (SAE)

V4-20	810188 810189	MOTOR FRAME	182/184 213/215
V4-32	810191 810192		213/215 254/256
V4-50	810192 810194		254/256 284/286
V4-80	810197 810198 810199		254/256 284/286 324/326

Bolts Incl'd. w/All HD Brackets

R2 (ALL)	125612 125613 125614	MOTOR FRAME	182T 184T 213T/215T BK-B-1
R4 (ALL)	308376 308377 308378	(5.2 to Centerline) (6.3 to Centerline) (7.09 to Centerline)	830048

ACCESSORY ITEMS TO A2 - A6 - A7 - A8

MOUNTING BRACKETS

PUMPS/MOTORS	MOTOR FRAME	P/N
A2F 10/12	213/215 254/256	H810 032 H810 036
A2F 23/28 A6V 28 A7V 20/28	213/215 254/256 284/286	H810 033 H810 037 H810 042
A2F 45/55 EZ 31 EX 31 A6V 55 A7V 40/55	254/256 284/286 324/326 364/365	H810 038 H810 043 H810 046 H810 050
A2F 63/80 EZ & EX 60/71 A6V 80 A7V 58/80	324/326 364/365 404/405	H810 047 H810 051 H810 055
A2F 87/107 EZ & EX 91/106/125 A6V 107 A7V 78/107	324/326 364/365 404/405 444/445 447/449	H810 067 H810 052 H810 056 H810 062
A2F 125/160 A6V 160 A7V 117/160	404/405 444/445 447/449	H810 057 H810 063
A2F 182/225 EZ & EX 146/172 A6V 225 A7V 164/225	364/365 404/405 444/445 447/449	H810 068 H810 058 H810 064
A2V 12	213/215 254/256	H810 034 H810 039
A2V 28	213/215 254/256 284/286	H810 035 H810 040 H810 044
A2V 55	254/256 284/286 324/326 364/365 404/405	H810 041 H810 045 H810 048 H810 053 H810 059

MOUNTING BRACKETS

	MOTOR FRAME	P/N
A2V 107	324/326 364/365 404/405 444/445 447/449	H810 049 H810 054 H810 060 H810 065
A2V 225	364/365 404/405 444/447 447/449	H810 069 H810 061 H810 066

COUPLINGS (ROTEX)

FOR PUMP/MOTORS SIZE	PRE-BORE DIAMETER MOTOR	AXIAL PISTON UNIT
10/12 23/28	1.50	.79 .98
23/28 45/55	1.65	.98 1.18
45/55 63/80 87/107	1.89	1.18 1.57 1.57
87/107 125/160 182/225	2.36	1.57 1.97 1.97
182/225	2.95	1.97
182/225	3.15	1.97

Valve accessories

DIRECTIONAL CONTROLS

VALVE SERIES	SUBPLATE		BOLT KIT
3SE6	G 270/5 G 273/5	1/4" 3/8"	BK-F1-15
3SE10 (ANSI D02)	G 66/5 G 67/5	3/8" (5,000 PSI) 1/2" (5,000 PSI)	BK-F1-16
	G 308/5 G 292/5	3/8" (10,000 PSI) 1/2" (10,000 PSI)	BK-F1-17
WMM/WMR/WMW/WMD/ WH/WP/WN/ WE-6 (ANSI D01)	G 341/5 G 342/5 G 502/5	1/4" 3/8" 1/2"	BK-F1-1
WMM/WMR/WMD/ WH/WP/WN/WE/ 5-WE/WEH-10 (ANSI DO2)	G 66/5 G 66/5-A-6 G 67/5 G 67/5-A-8 G 535/5 G 536/5	3/8" 3/8" w/Side Ports 1/2" 1/2" w/Side Ports 3/4" w/X + Y Ports 1" w/X + Y Ports	BK-F1-2
WMM/WH/WEH-16 (ANSI D04)	G 172/5 G 174/5	3/4" 1"	BK-F2-4
WMM/WH/WEH-22 WMM/WH/WEH-25 (ANSI D06)	G 153/5 G 154/5 G 156/5	1" 1-1/4" 1-1/2"	BK-F2-5
WMM/WH/WEH-32 (ANSI D10)	G 157/5	1-1/2"	BK-F2-6

CHECK VALVES

VALVE SERIES	SUBPLATE		BOLT KIT
S10P	G 460/5 G 461/5	3/8" 1/2"	BK-G-4
S20P	G 106/5	1"	BK-G-5
S30P	G 108/5	1-1/2"	BK-G-6
SV/SL10P	G 460/5 G 461/5	3/8" 1/2"	BK-G-25
SV/SL20P	G 412/5 G 413/5	3/4" 1"	BK-G-26
SV/SL30P	G 414/5 G 415/5	1-1/4" 1-1/2"	BK-G-27

PRESSURE CONTROLS

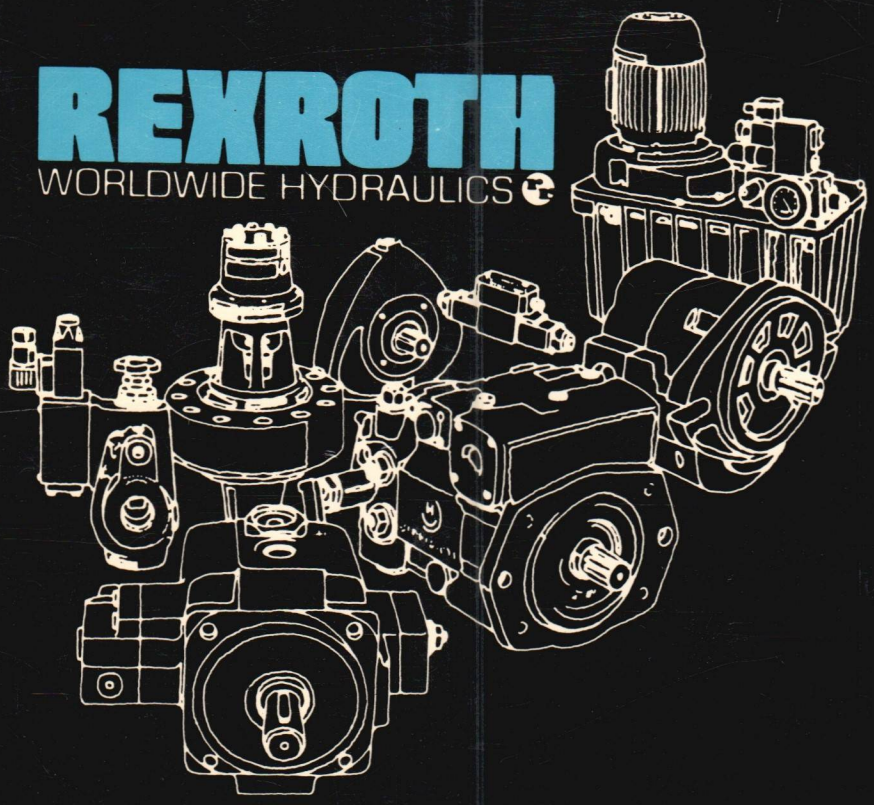
SERIES	SUBPLATE		BOLT KIT
DBD-6	G 300/5	1/4"	BK-H1-1
DBD-10	G 302/5	1/2"	BK-H1-2
DBD-20	G 304/5	1"	BK-H1-3
DBD-30	G 306/5	1-1/2"	BK-H1-4
DB/DBW/DBE/ DBEM-10	G 406/5 G 407/5	3/8" 1/2"	BK-H1-12
DB/DBW/DBE/DBEM/-20 (SERIES 30) DB/DBW-20 (SERIES 40) ANSI R06	G 408/5 G 409/5	3/4" 1"	BK-H1-13
DB/DBW/DBE/ DBEM-30 (SERIES 30) ANSI R10	G 410/5 G 411/5	1-1/4" 1-1/2"	BK-H1-14
DZDP/DRDP-6 (ANSI D01)	G 341/5 G 342/5	1/4" 3/8"	BK-F1-1
DZDP/DRDP-10 (ANSI P03)	G 460/5 G 461/5	3/8" 1/2"	BK-H2-2
DZ/DR-10 (SERIES 30) DR-10 (SERIES 40) ANSI P03	G 460/5 G 461/5	3/8" 1/2"	BK-H3-6
DZ/DR-20 (SERIES 30) DR-20 (SERIES 40) ANSI P06	G 412/5 G 413/5	3/4" 1"	BK-H3-7
DZ/DR-30 (SERIES 30) ANSI P10	G 414/5 G 415/5	1-1/4" 1-1/2"	BK-H3-8
DA/DAW-10	G 467/5 G 468/5	3/8" 1/2"	BK-H3-6
DA/DAW-20	G 469/5 G 470/5	3/4" 1"	Consult Factory
DA/DAW-30	G 471/5 G 472/5	1-1/4" 1-1/2"	Consult Factory

FLOW CONTROLS

SERIES	SUBPLATE		BOLT KIT
2FRM-5	G 44/5 G 45/5	1/4" 1/2"	BK-I2-1
2FRM/FRH/FRW/ FRE-10 ANSI 2F02	G 279/5 G 280/5	1/2" 3/4"	BK-I2-2
2FRM/FRH/FRW/ FRE-16 ANSI 2F03	G 281/5 G 282/5	1" 1-1/2"	BK-I2-3

Notes

REXROTH
WORLDWIDE HYDRAULICS



REXROTH WORLDWIDE HYDRAULICS/Industrial Hydraulics Division
2315 City Line Road, Bethlehem, PA 18018 (215)694-8300 Telex 84-7498

REXROTH OF PITTSBURGH
P.O. BOX 298
GLASSPORT - ELIZABETH ROAD
ELIZABETH, PA 15037
(412) 384-3220 (412) 431-8300
800-472-2467